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Present-Day Gardening

EDITED BY
R. HOOPER PEARSON
MANAGING EDITOR
OF THE *GARDENERS'*
CHRONICLE.

A LIST OF VOLUMES
IN THE SERIES IS
GIVEN ON THE NEXT
PAGE.

Present-Day Gardening

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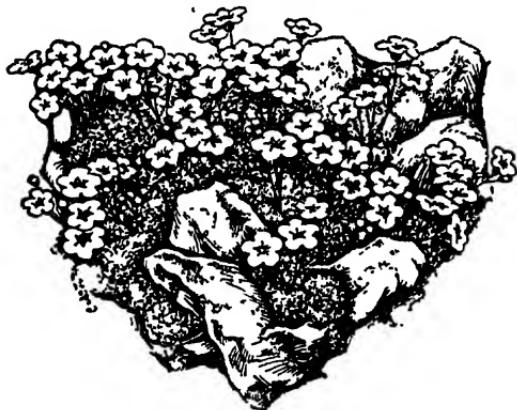
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PLATE I (*Frontispiece*)

GENTIANA ACAULIS AND DRABA DEDIANA



The
Rock Garden
By Reginald Farrer
With Eight Coloured
Plates



London: T.C. & E.C. Jack
67 Long Acre. W.C. & Edinburgh

PREFACE

IT would be difficult to point to any province of floriculture in which so important and indeed revolutionary advances have been made within a few years as in that of Rock-gardening. In place of the dismal mess of oddments that formed the old-time "Rockery," with its wretched inhabitants pining beneath the drip of trees, smothered among common ferns, ivy and periwinkle, we find a new creation, in which numbers of the choicest alpines can flourish with a vigour almost equalling, and indeed sometimes even surpassing, that of the plants on their native hills. All this has come about by a keener study of natural conditions, and the consequent discernment of the principles which underlie successful practice.

No one has done more to bring this about than Mr. Farrer himself, who is everywhere recognised as a pioneer in the movement. He has travelled afar, and has seen, collected, and above all has *observed*, in their native homes, many rare species that are known to most of us only at second hand, so to speak, under cultivation. Moreover, by the device of the moraine garden he has shown us how to grow with relative certainty and ease, many a plant that used to be regarded as difficult or impossible.

It is truly a wonderful fascination that surrounds these children of the hills, as Mr. Farrer well calls them, and makes them appeal to one in a way that the most magnificent flower border, with all its barbaric splendour, can never do. As a class, the alpine plants are purely delightful, and the elusive coyness of not a few makes them even more wholly desirable. The glow of satisfaction which is the reward of success with the shy species of primula, campanula, saxifrage, and many other genera—I omit all mention of impossibilities like *Eritrichium nanum*—is something not readily forgotten.

The factors that determine the difference between success

PREFACE

and failure are often apparently slight ; but whatever they be, for the given environment they are fundamental, and must be discovered by each one for himself. It may be a matter of soil, aspect, drainage, or half a dozen other things ; observation and experiment must unravel the tangle, for there is, perhaps fortunately, no royal road to our goal. Indeed alpines, with all their little ways and idiosyncrasies, provide plenty of problems both horticultural and biological, and many of these are of no mean order. Why is it, for example, that some species are so intolerant of crowding, whilst others never seem to be so floriferous and so riotously happy as when they are invading each others' territories ? What are the real causes that determine the brilliance of the flowers, and the presence of those other characters so distinctive of many (*but not of all*) of the plants of the high alps ? What, again, is the meaning of those curious "replacing species" that represent one another on the granite and calciferous rocks respectively ? For the solution of these and many other problems we seek at present in vain.

But from whatever sides our individual interest in the alpines may spring, the most important thing to know is what to grow and how to grow them. And just as the traveller in the mountain homes of the alpines does well to go with first-class guides, so too the would-be rock gardener will find many of his difficulties smoothed away under skilful and competent leadership. Guideless climbing is a supreme joy for the experienced man, but he would be the first to admit that there is always something to be learned from others. It is just the same in the practice of gardening, and especially alpine gardening. Thus it is by no means the beginner only who can profit by a book like this, but the older craftsman can hardly fail to find in it much that is stimulating and something that is new.

J. BRETLAND FARMER.

GERRARD'S CROSS, BUCKS.

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THE ROCK-GARDEN

CHAPTER I ITS HISTORY AND BUILDING

TIMES have wholly changed for the rock-garden. Fifty years ago it was merely the appanage of the large pleasure ground. In some odd corner, or in some dank, tree-haunted hollow, you rigged up a dump of broken cement blocks, and added bits of stone and fragments of statuary. You called this "the Rockery," and proudly led your friends to see it, and planted it all over with Periwinkle to hide the hollows in which your Alpines had promptly died. In other words, you considered only the stones, and not the plants that were to live among them. No wonder, then, that the rockery came soon to be looked on as the rich man's extravagant fad: that a poor one would as readily have thought of having a French chef: and that between 1870 and 1890 there should have been an almost general slump in the noble and exquisite art of cultivating Alpine plants.

Thanks, however, to the insistent crying in the wilderness of a few ardent evangelists a revolutionary change has passed over the scene in the last twenty years. The personalities of the Alpine plants have come to engross the

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attention of their cultivators, and the actual rock of the structure has lost almost all its importance, except as the stage on which the children of the wild hills are to be made play out their captive life. And as such, of course, its main point is that it shall be so built as to help them play it out with the utmost brilliancy and happiness of which captivity is capable.

With this change of thought there has come another, of even more importance to the gardener at large, and one which has ultimately had the privilege of causing this book to be written. For, as soon as the rock-garden began to be looked on only as the best way of growing rock-plants to perfection, it became obvious that, instead of being the most expensive, it was really by far the cheapest and most repaying form of gardening. It has become accordingly, and is hourly still more universally becoming, the pet passion of the man who has small means, and only a small plot of ground to play with. In older days he had to content himself with a little pimply bed of Pelargoniums in a lawn like a handkerchief, with a Monkey-Puzzle in the centre: or, if his opportunities were yet smaller, and his ambitions keener, he could wrestle with Roses in a back-yard.

But now the truth has dawned, and its full daylight is approaching: for much less cost of time and money, you can have a much more brilliant show than even Pelargoniums can give; and of plants whose personality has far more interest and charm than any bedding Annual. Nothing, in fact, could possibly fill the small garden plot with perennial delight, so adequately, cheaply and appropriately as a constellation of rock-plants.

POSSIBILITIES OF THE ALPINE 3

The old ideas of the rock-garden itself are to be set aside: no expensive Drunkard's Dream of stony spikes and pinnacles is wanted. If you wish to grow Alpines with joy and glory you cannot be too simple and inexpensive in your preparations. Very little stone indeed is needed; it is far easier to have too much than too little: a lovely rock-garden is often made without any visible stone at all. For the only essential part of stone, from an Alpine's point of view, is that it should be buried under ground, so that one's roots may run gripping along its sides, and penetrate underneath in search of the moisture that is always there. So that, with a few little blocks sunk well into the soil, some quite small slope, or gently elevated bed in a cottage or villa garden can show, for practically no cost of money or trouble, as splendid a display as anything that the Alps themselves could afford.

This scheme, of course, is only the very baldest and cheapest beginning. The gardener who has thus achieved wide stretches of Mossy Phlox or Mazarine Speedwell won't be content to stay at that point for ever. Gradually his ambitions will swell, with the more ambitious exactions of the haughtier plants to which he soon aspires; appetite grows by success; and not the smallest owner of the rubbliest back-yard in Birmingham need fail of those initial successes if once he makes a profitable start.

And it is for the smaller grower that I am now especially writing; it is still possible, indeed, and with increasing enlightenment, to build royal landscape-rockeries of peak and valley and boulder, at any cost up to five-and-twenty

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thousand pounds or more. But the essential nature of rock-plants, and the whole meaning of this book, is, that for five-and-twenty shillings, it is no less possible for you, in a tiny and ill-favoured space, amid untoward surroundings, to have exactly the same quality of beauty, from exactly the same plants—yes, and very possibly achieve a patch of *Dianthus alpinus* or *Gentiana verna* that would make the twenty-five-thousand-pounder go green with envy. For Alpines, being really noble, are the most democratic of plants, and know no distinction of rank or wealth ; all that they know and care for are their friends, whether from pithead or palace. Their instincts are unerring, and they have no respect of persons.

Now, then, for the creation of your rock-garden. The two absolute essentials, in the first place, are these : an open situation, and perfect drainage. You must never try to grow Alpines anywhere under the influence of trees. A dank hollow is doom ; drip is damnation. It is imperative to choose a place where sun and air have all the play they can. It need not matter if the sunlight only falls for a few hours ; the essential point is that your Alpines must not be darkened *immediately overhead*, by any malignant presences. Overhanging branches must be hewn well away ; encroaching bushes cut back until they know their place.

But, even more important than that, if possible, is the necessity of perfect drainage. For Alpines, though usually sweet-tempered, are easily irritated by clogging damp. Therefore, you must be sure and lay your fundamental precautions well and thoroughly against such damages. It is easily done ; I only warn you so passionately, to make

DRAINAGE AND SOIL 5

sure that it is done. What you have to do when getting ready your bed for rock-plants, be it big or little, is, instead of merely taking out two foot of soil in preparation, to take out three. You then, at the bottom, lay a foundation of rough clinkers, brick oddments, broken stone, etc., for the depth of 9 inches or a foot. Then in on top of that goes your made soil ; and you have perfect drainage. This applies, of course, most closely, to a bed made on the level, or in a hollow, if it has to be made there. But even on bank or slope, though so much precaution is not so vital, it can never do harm, and always good. And it applies quite as urgently, even if you are able to think of making even the tiniest of bog gardens, such as by sinking the sawn half of a tub some quarter of an inch below the ground level, excavating a two-foot deep trench round it, and filling up with first 6 inches of drainage, and then a good mixture which will be kept damp, according as the tub is filled to overflowing.

I talked of making soil. This, I think, it is *always* as well to do, if you can, though Alpines grow luxuriantly in any rich, well-fed, and well-matured ground, such as the soil of an old kitchen-garden. In point of fact, though crude manure is loathsome to their delicate taste, all mountain plants fairly revel in ripe and very rich conditions. (Some of them, even,—a few—overeat themselves, and become too torpid to flower.) Therefore, it is best to give them something good, and better suited to their need in the way of food and drainage, than the ordinary soil of the border. One's ambition is to get a mixture rich yet light, not dusty in summer droughts, nor caky and ponderous in winter rains. My own prescription is, to

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take two parts of the best loam you can get (that of your own garden may do very well), which should, for choice, be fibrous, clean, and on the heavy side. Dig well into this one part of powdered leaf-mould, and another part of fairly coarse silver sand. This will give you an ideal mixture. But of course this is *only* an ideal (and only a general suggestion); you may not be able, or willing, to make so much fuss; and then your ordinary garden soil *may* do very well for you, if your drainage be perfect and your position open, and your ambitions not inclined to rise beyond the commoner things; only nothing ever does quite so well as that which does best. And I mean to take it for granted that the very best is what you will ultimately aim at.

Another important point that I urgently recommend, is that, when you have got your mixture ready, you dig into it (two spadefuls to a barrow load, or a little more) some coarsely powdered lime-rubble, such as mortar from an old wall. The enormous majority of Alpine plants, some 95 per cent., I should say, crave and clamour for abundant lime in the soil. In the case of the rare exceptions, which I shall notice if they are really beyond conversion (for very often a plant peculiar to granite hills is perfectly happy with lime in the garden), you will, of course, omit the lime, and substitute peat, or at all events one part of peat, for the loam in your mixture. And the last acme of perfection is reached, if, to either peaty or limy concoction, you add (to each barrowful) two or three spadefuls of finely broken road metal (anything but flint),—rough chips about the size of your finger tips. Besides enormously helping the drainage, these keep

moisture too, and provide gripping-hold for the fibres of your treasures. So, with this composition, you have an absolute certainty of success with your choicest Alpines. I repeat that none of these fine fussments are necessary for a dazzling sixpenny show of *Arabis* and *Alyssum*: but, with this mixture prepared and laid down from the beginning you will be justified at any moment in going on later to *Primula Allionii* and *Saxifraga diapensioeides*. It is always easiest to do good work, if you begin doing it from the very start.

Now, we have our bed excavated and our soil ready. The question of stone arises. Nobody wants, and many people are unable, to spend much money on importing stone from elsewhere. If you do, the white mountain limestone of the Craven district¹ is far and away the best of all rockery formations. It is very helpful and nourishing to plants; and is also, in itself, extraordinarily beautiful, waterworn into noble lines and crevices and irregularities. Failing this, most people go on the prudent principle of taking what they can get. My strong advice is this: don't get any more than you can help, and be very certain to use nothing that is not absolutely clean stone—no brick, no slag, no clinkers, no fragments of masonry or statues. Ambitious compilations, ill-assorted blocks and odds and ends of ruin in a back-yard are among the most lamentable objects that life can show. Nor will fine plants endure such; only the coarsest will even live on them. What you want, say (if you are starting with the bare ambition to grow Alpines well) in a bank, or strip of 15 x 1 yards, would be some twenty-two foot-

¹ Craven Nursery, Clapham, Yorkshire.

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THE ALMOND-PUDDING SYSTEM
(The wrong arrangement of spikes)



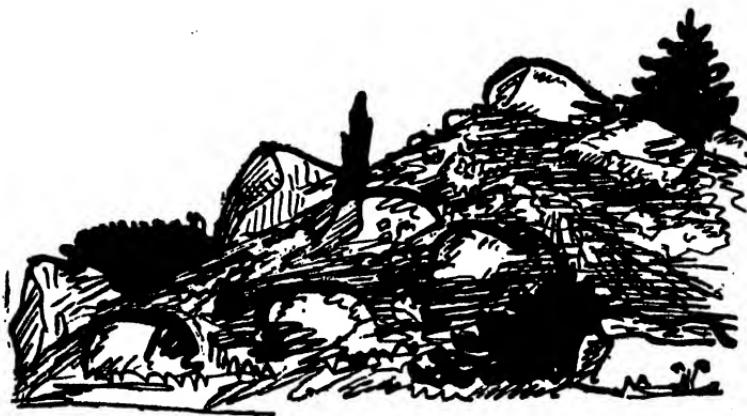
A RIGHT PLACING OF SPIKES
(With evergreens)

ARRANGEMENT OF ROCKS 9



THE PLUM-BUN SYSTEM

(The wrong arrangement of Humpety-Dumpeties—haphazard and disconnected)



A MORE TOLERABLE WAY OF USING HUMPTY-DUMPETIES
(With evergreens)

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long knubbles of clean rough-edged stone, all buried happily (if they are too ugly to show) about two inches under ground, and always at a downward, inward slant, to carry moisture to the roots of your plants. This rule applies with equal importance, whether you are dealing with good rocks to show, or merely with ugly ones to bury.

But stone, of course, can be, on the other hand, as entrancingly attractive in itself as any flower. The joy of a noble boulder rightly placed, is something complete and perfect. And there *need* not be more than one such in your garden (and the other ugly ones buried) : there should never be many, or they then overcrowd the picture and spoil their own effect. So far I have considered stone, however, only from the point of view of the poorest or least ambitious gardener, who wants to make his back-yard or his villa frontage bright and beautiful at a small cost : so takes to Alpines, grown in their simplest form, in a bed, strip, bank, or unambitious mound. Now I will turn, for a time, to those who soar to flights a little higher, and want, not only lovely plants, but a satisfactorily built stony hill on which to display them. And here we come to great universal laws.

For (and this I say as earnestly to the man who has only a few square yards to deal with, as to him who is covering acres) all good work in this matter depends entirely on initial design. Nature is never haphazard : inspirations from nature must never be haphazard either. Never think you are going to get a dignified result by humping a quantity of stones indiscriminately together. And never think, either, on the other hand, that you can't get the

ARRANGEMENT OF ROCKS 11

noblest and grandest effects, just because your ground is no more than a quarter the size of a small bedroom. In spaces no bigger, any Japanese townsman will have at the back of his house some apt and perfect little valley or mountain dell. This is done by nothing more than an exact sense of proportion, and by care spent beforehand in pondering the possibilities of the ground and the materials.

Of course it is impossible for me to prescribe you plans for your many diverse gardens ; but, if you want a beautiful rockery, as well as beautiful plants, you must think it out for yourself. Watch your ground, consider the stones that you've procured : soon the situation will show itself gradually shaping into a glen, or a mountain gorge, or some high slope, or notch between twin peaks. Not, of course, a copy or reproduction of such effects : that would be absurd ; my meaning is only that they should inspire you with a suggestion, as you begin to mould your plans. Or very often it will be some specially beautiful boulder that will insist on such and such a position, and make you build up to it as the dominant point of your picture.

So important is such forethought and training of taste, that I urge it yet again. It is far too rarely practised. We are much too fond of shirking this delightful trouble (pretending, in our laziness, that we are incapable of it). We are much too fond of throwing ourselves blindly into the care of an "expert," who often knows no better than we do, does not respect our wishes, and has not half our taste.

Good or bad, let your garden always be *your own* : sympathetic trained advice is of the greatest help ; but by

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entrusting the building of your rockwork on contract to a nurseryman whose main idea is probably cement or grit-stone slabs, you are not likely to get a garden that fits your personal taste and character.

Now, though I cannot dictate schemes to your particular fancy, these are the two elementary, but vital technical points of construction that I can safely give you : In the first place, whatever your scheme, be *very* careful that *all the interstices between and behind your rocks are firmly filled and rammed with soil. This must be done in the building.* Cavities behind are inevitably fatal to choice rock plants. And the second—be sure to *get your stones so far and so firmly set into the ground that they are solid as the eternal hills, never to be shifted by frost or foot or flood.* Far too commonly does one see mean little insecure bits of building, which hand or tread can overturn. The choicer Alpines dislike this inefficiency as much as I do ; they sicken and die unless the rock that upholds them, or the crevice that squeezes them, is free from any inclination to gape or give. So if your stone is too small for such work, let it be buried frankly underground, and be content to make itself merely useful.

Now for a few more general hints. Stone, in nature, is never disconnected ; each block is always, as it were, a word in the sentence. Remember that, urgently : boulder leads to boulder in an ordered sequence. A dump of disconnected rocks, with discordant forms and angles, is mere gibberish. So that you must take pains to treat your rocks as syllables : join them carefully up in harmonious order, and make your compilation a coherent whole. Another point : let no persuasion, no temptation,

PLATE II
DIANTHUS ALPINUS





IMPORTANCE OF EVERGREENS 15

neither prayer, force, nor bribery, ever induce you to stick your stones into the ground point upwards. *Stone always lies on its heaviest face*; it never towers violently aloft like a steeple gone mad. In the North this style of gardening rages among small gardeners, and nothing will grow in these Almond Pudding "Rockeries" but common Ferns and Welsh Poppy.

Last of all comes a point at which I can only hint, but each one must work out for himself, in connection with his own territory and scheme. And that is, the importance of small evergreens, if you want to make your garden a picture. For these, if properly placed, have the most astounding power of giving space and composition. They can make any rock look high or low, natural or artificial, near or far. I can best suggest some of their effects by sketches, which are meant at once to indicate some proper schemes of stone, as well as of evergreens. One shows unnatural distortion, and a way of restoring it to calm; another a haphazard jumble of disconnected stone syllables, with a scheme for turning chaos into order and producing a harmonious sentence.

But, in any case, the proper arrangement of evergreens on a rock-work is quite magical in at once giving majesty and vastness to what might otherwise, however well built, have looked an insignificant hummock of stones, because there happened to be a blank wall, or a church spire, or a factory chimney just beyond; and nothing on the rock-work itself to set up a new, independent, and self-contained scale of values and proportions. Among the best are, for miniature trees, *Abies concolor compacta*, *Pinus sylvestris beuvronensis* and *globosa*, *Cedrus*

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atlantica Comte de Dijon, *Picea excelsa Ohlendorfii*, *pyramidalis* (largish), *Remontii*, and *Clanbrasiliana*. Of columnar forms, *Picea excelsa inverta*, *Juniperus hibernica* and *J. hibernica compressa* (a minute jewel) are excellent : flattish-growing varieties of *Picea excelsa* are *repens*, *nana*, and *pygmaea*. Quite prostrate in habit are *Juniperus prostrata*, *J. procumbens nana*, and *J. Sabina* var. *tamariscifolia*.

CHAPTER II

WHAT IS AN ALPINE ?

I AM faced at the outset by the difficulty of definition. However, if you ask me what you are to put in your rock-gardens, I briefly reply, "anything that looks well there and suitable, no matter where it comes from." No tender bedding things. No big herbaceous things (I am writing now exclusively for the small and purely Alpine garden, not for the vast landscape rockery, where big herbaceous things are in place). Above all, no annuals of any kind, except *Linaria alpina* (which isn't one) and *Gentiana nivalis* (if you can raise it and grow it : I can't do either). The essential quality of real true Alpines is their long perseverance in beauty against untoward circumstances. To associate them, then, with some flimsy little ephemeral annual, is to make the Alpines look insulted, and the annual tawdry. So for present purposes then I will define the worthy occupant of your rock-garden as never much exceeding a foot in height ; and the dwarfer it is, the more brilliant and appropriate.

SOURCES OF SUPPLY 17

So much then for the vague general definition of the plants that will worthily furnish your rock-garden. The technical definition of an "Alpine" is much easier and simpler : for all things, indeed, that look well in rock-gardens are not by any means "Alpines," and by no means do all Alpines look well on the rock-work—or indeed anywhere else ; but the rock-garden does exist in essence for the purposes of such chosen hardy plants as inhabit the high mountain ranges of the world, north and south, between 5000 and 15,000 feet. Our main sources of supply, of course, are the European Alps : Lebanon, Caucasus, and the Levant supply some treasures ; the Rockies others ; the Alps of New Zealand have hardly yet been called into contribution ; and almost wholly untapped as yet, by comparison with their vast possibilities, are the Himâlyan ranges to both sides of the Roof of the World, in Kashmir, Sikkim, Nepal, Thibet, Yunnan and Szechuen.

Setting aside for a moment the Levantine species, the common character of all Alpine conditions is evident : a high, cool and quite pure air, limpid with moisture through the whole growing period, so that the sun's rays can never parch, despite the ferocity with which they smite down through the thin and rarefied atmosphere ; a soil stony, perhaps, but enriched with the vegetable decay of twenty thousand years ; drainage very sharp and perfect—all the rivers of the world running through and off their mother-mountains like water through a sieve, or off a duck's back ; a season short and quick and sweet, from the melting of the high snows through April, May, and June, which makes the mountains a sponge of moisture,

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to the descent of the high snows again by the end of August, under whose coverlet the children of the hills mature their seed and then retire to rest, perfectly warm and dry beneath the frozen surface, until the bondage is loosed, and their life begins again with its going.

Those are the invariable general conditions of Alpine life ; but each great range has its local peculiarities, which have their influence on the characters and cultural demands of its plants. An experienced cultivator soon gets to feel his way to a novelty's general needs by a knowledge of whence it hails : the European and Canadian Alps produce the simplest-minded species ; the Levantine ranges have evolved races that like a cold dry winter, and a hot dry summer, with abundant rain in spring, and specially sharp drainage ; the New Zealand Alps indulge their inhabitants with a super-arctic winter and a super-torrid summer, which makes them notably impatient of all our pale and tepid seasons ; and the Himalayas rise so high that their atmosphere is perpetually haunted by mists and moisture in the growing-time, which makes their children sadly thirsty during our dry-aired summer, and often perilously waterlogged in the leaden sloughs of our winter.

For the high mountain plants, while they are in activity, are always drinking greedily from earth and air : and no less copiously perspiring. They have often evolved a coat of fluff that soaks up all the available humidity during their growing time, and prevents them from excessively sweating it out again under the sun's clear rays. Neither this need nor this danger presses them in our gardens ; and the coat of fluff becomes instead a mortal peril. For

it helplessly sops up the waters of winter when the plant is lying dormant, until the whole sodden mass turns rotten and dies. Therefore it becomes necessary, in any mild-wintered English climate, to put a *pane of glass over any mountain plants that show a danger-sign of fluff or down.* The precaution is simple and effective ; the pane, of course, must be so arranged as not actually to press upon the plant itself : poise it evenly on four small stones : old glass dishes that have contained potted shrimps or sardines are often recommendable for small subjects, such as all the high Alpine *Androsaces* *Helichrysum frigidum*, and *Eritrichium nanum*, to whom such protection in winter is *vital*.

It will be obvious that the wintering of Alpines *ought* to be a difficult problem. *Nobody has ever found it so*, not even I, who suffer from a climate peculiarly clogged and clammy in winter. Cold, of course, is never the enemy of Alpines ; if we could be sure every year of being hard frost-bound from October to April, then our rock-gardens would blossom forth like the Rose, with the choicest of high mountain flowers. It is, of course, the cloying damp of our dead season that afflicts them ; yet, in moraine, or on firm, properly built rock-work, with its soil well drained and levelled to a fairly rapid slope, I do not think that any of them need ever be expected to take any harm in winter. It is essential to them, of course, *that their drainage be in perfect order* ; and I very strongly urge that no Alpine be planted out after the beginning of September. For all the hill-plants set to work making their new roots about August ; and if planted too late, they have often not had time to grip firm hold of their surroundings before a frost

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has come and cracked their ground and broken them away from their anchorage. Then comes a thaw and heavy rain, and then another frost. And then more rain ; till in the end they are washed clean out of the ground, and lie helpless, with feeble fibres asprawl on the dank earth ; at the worst they rot and die ; at the best a whole season's growth is lost. . . .

The best time, as I believe, for moving all Alpines, and for dividing most, is in August or early September. Spring-planting is usual, *and quite satisfactory*, but imposes an immediate trial on the newly-planted specimen. The enormous majority of Alpines, excepting Campanula, bloom in the garden between April and the end of June, and, if planted in spring, they at once begin to put their whole energies into the strain of producing flower and seed ; whereas, if planted in September, they have the long autumn and winter in which to get quietly at home and establish themselves in their new surroundings, so that by next season they are able to bear much better flowers, and with far less strain than if they had only had a month or so in which to prepare. Add to which that in spring our soil is chilly, sodden and inhospitable to the shy new roots ; while in September, it is so warm that the plants feel happy in it at once.

For it is to be specially noted, I think, that, contrary to the accepted rules, Alpines *like best to be moved at the highest* moment of their vitality—that is, at, or just after, the zenith of their flower. For their roots are annual ; they push on in March and April from their first stage, and work up to the flowering time in June or July (May and June in the garden). Then there is a pause ; the

METHOD OF PROPAGATION 21

plant blooms and seeds, while the current season's roots gradually cease to be active. And then, after this, the new fibres come foraging forth, while the old ones either decay or stay idle. And the new ones have got full hold before the snows descend ; they sit tight, and anchor their vessel to its place through the winter, until the spring enables them to go ahead again, with an eye to flower. Accordingly, as I say, to economise the plant's strength, I *rather prefer* taking the roots at their first emergence in full summer, instead of waiting until they have begun their second spurt next spring. But, of course, this is only a doctrine of perfection ; in point of fact, all Alpines can, with due care in watering, be transplanted or put out with complete safety at any moment between March and October.

With regard to their propagation, the means that I myself most recommend are, by cuttings at almost any time of activity ; or by offsets or division, preferably in April or September. Cuttings, offsets, and divisions alike, should be inserted firmly into a cool sandy soil, in a frame, if possible, and kept shaded from excessive sun-heat. Watering should be constant and careful, *but sparing*, so as to keep their ground moist, but by no means wet. Of course their propagating-bed must be perfectly drained. Slugs must also be warded off by means of zinc fences, bran, hand-picking and traps. Thus treated, Alpines root both promptly and prodigiously. A large stock can be raised in next to no time. These methods are conspicuously adapted to the views of Saxifrages, Rock-Primulas, Rock-Roses, Aubrietias, Campanulas, and Pinks. Many, of course, such as spreading Anemones or

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Campanulas, Aeizōon Saxifrages, tufted Primulas—anything in fact which has formed a wide clump or colony, may simply, at any time, be dug up, pulled to pieces, and replanted on the spot or anywhere else. Late August or early September is the best moment; but all times are good if you can water adequately in case of drought (as then, naturally, for a week or two, the fragmentary new plant likes the encouragement of moisture for its pushing roots).

The following species and many others can be profusely and profitably raised from seed: Aubrieta, Aethionema, Alyssum, Primulas of the larger sections, Aeizōon and Mossy Saxifrages, Campanulas, Dianthus, Helianthemum, Poppies, Aster alpinus, Flannel-Flower, Geraniums, Linums, Linaria, the larger Gentians, Anemones, Columbines and Tunica. They can even be sown straight out in carefully prepared beds in the open. All they'll want is watering and weeding at need. The Aeizōon and Mossy Saxifrages, however, are best sown on natural cushions of moss, where, without any attendance they will germinate like cress. If sown in fresh pans, the seed should be very thinly covered with soil, and any weeds and lichen removed as they appear: microscopic grains, like those of the small Saxifrages, must be sown on the bare surface; and in such a case, it is better to soak the pot (standing it in a tub, with water enough to reach its rim) rather than to flood it with a watering-can and run the risk of washing away the seed. If very choice, sow them on the surface of some seed pan which has proved a failure and only generated a sheet of moss. Such treatment also answers for the tinier Rock-Primulas; but on the whole I consider the raising of choice high Alpines from seed to be a slow

and rather precarious pursuit. Nor do I think the resulting seedlings are so much more vigorous than rooted cuttings as to justify the trebled trouble and the slow process of their raising.

The enormous majority of Alpine plants, despite the peculiarities of their natural conditions, are quite extraordinarily easy, robust, and hearty in cultivation. They are also, by force of nature, dazzlingly brilliant and profuse in flower, cosy, compact and dwarf in shape; and they have (apart from their brave and blazing loveliness, and the charm of their sedate refined habit) a personal force of attraction such as no other plant can hope to rival—the attraction of their limitless courage, of their stubborn individuality, of their indomitable ingenuity against difficulty, far up in the grim and lonely places of the world. With the usual run of mountain plants indeed from between 5000 and 7000 feet, all is comparatively easy sailing (with only a few but conspicuous exceptions) for the careful cultivator, who wants to know his job, and has duly arranged the few and simple preliminary precautions that are necessary. Difficulty begins only when you have reached the fringe of the everlasting snow, and the high-stone shingles where the rarest beauties have their home. And here there are exceptions too, but in the reverse direction, for some of the shingle-people are as easy as anything we have.

The most choice and delicate of the difficult species, however, might perhaps be profitably cultivated in pots, and wintered in frames. Thus they (and any other rock plants) can be kept perfectly secure through the dead season : the frames being opened on mild fine days, closed

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firm against rain or snow, and watered not at all in winter, and only (if at all) from time to time in early spring, if the weather conditions be extra dry. Conspicuous candidates for such pot culture are the high Androsaces and Eritrichium. But, to me personally, it seems a confession of weakness to grow an Alpine permanently in such confinement. I would as soon try to keep a Bird of Paradise in an inkpot. Unless one can grow a plant happily, with a reasonable amount of care, in the open, there are many gardeners, I hope, who will agree with me that it is better not to plague the poor thing at all with such artificial assiduities. The case is quite different, though, if you can have a little cheap, unheated, side-ventilated greenhouse, where you may keep pan after pan of Alpines close under your rejoicing eyes, forever unmarred by the vicissitudes of slugs and weather.

But quite lately, a new method of cultivation has been discovered by which the hardest of Alpines are made to grow as happily and heartily as the commonest. For the haughtiest of miffs and mimps become quite at home in the moraine.

CHAPTER III

THE MORAINE

AND this is how you make the moraine: you take out your 3 ft. of soil, and you first put in, at bottom, about 1 foot of coarse broken blocks of any sort for drainage. And you then make a special mixture: to *one part only* of the prepared Alpine soil (see p. 6; but remember that

PLATE III
VIOLA GRACILIS



FORMATION OF MORAINE 27

here you can make each special mixture to taste, and form a special compartment for different sets of plants : a strip of chips and pure sand, another of chips and pure peat or leaf-mould, a third of chips and limy or granitic loam, and so on) you dig in five parts of finely broken road-metal, in chips about the size of the nails and top-joints on your various fingers (by far the best stuff is the blue Craven Limestone, which is not limestone at all, but a submarine volcanic conglomerate). The result is a heap of what looks like mere stone, uncontaminated by soil. But not only is its drainage perfect, and its nutritious qualities ample, but it preserves the moisture precisely as the heart of the most exacting Alpine desires. The moraine is never wet and never parched : on the wettest winter day it lets the floods go quickly through it, and drain away ; in the driest drought of summer its chips so delicately prevent evaporation that if you poke your finger two inches below the surface, you will find humidity. And the result of these ideal Alpine conditions is that the highest and most arrogant Alpines are quite taken in and imagine themselves at home : *Campanula cenisia*, the high Pansies, *Eritrichium* and many other species otherwise more or less hopeless, thrive and immediately grow stout on a well-made moraine ; while all the more ordinary Alpine lovelinesses, Campanulas, Pinks, Poppies, white Buttercups and Flannel-flower, are as rich and happy and free as on their native hills—to say nothing of the fact that against the ground of grey-blue chips, their colours have a clear purity of tone much richer than they can ever show against brown earth.

It is not too much to say that the discovery of the moraine and its possibilities has worked a second revolu-

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tion in modern gardening. The moraine is far cheaper than any sort of stone—anybody can have one, and anybody can put it anywhere (except, of course, under shade or drip of trees). It may even form a patch in some quite ordinary border or bed : and calls for no consideration of schemes and compositions and effects. It gives far less trouble in any way than the rest of the garden : weeds don't much like it, and anyhow, are plucked out by a single twitch : it needs virtually no watering in a favoured climate (and in any case, even in the parched South under a blazing sun, three canfuls over a moraine go further, last longer, and do more good than thirty anywhere else) ; and, finally, slugs object to walking about on it because the rough edges of the chips annoy their soft, fat stomachs. Thus, at an irreducible minimum of cost in any way, it enables any one with a garden only the size of a table, to start straight forward with a reasonable chance of gratifying his most exalted ambitions in the way of growing *Eritrichium* or *Viola cenisia*.

But, while I point out that in any little back-yard or villa strip you can dig out a patch and have a flowered slope of moraine for almost nothing, I must not let you forget that, in larger schemes, a moraine may be one of the most beautiful features in the composition. Let it, for instance, slope down from between two cliffs, like the high stone-slides of the Alps (it is these, of course, that it takes for its model : *Moraine* is technically a misnomer ; moraines are the pebbly, gravelly ridges of chaos ploughed up on them on each side as they go by the moving glaciers).

Many places, indeed, in any large rock-garden could

easily be found where a moraine would be both beautiful and in keeping, even if it never had flower or leaf on its surface. And every one, for his own garden, will devise a suitable place and scheme. A moraine should not be on a dead level, and it should not be set, on the other hand, at *too* raking a slope, as in this case it is liable to parch, the drainage being too rapid. If set at a fairly steep incline, it should be shored up by breasts of big rock, set very firm and profoundly : and if it be made on a more level plot, large flat stones should be inserted deeply to walk about on.

But yet another pleasant device is this. If you have not room, or inclination, for such a moraine as this, you can have a toy one, in the smallest garden or the greatest, which will be a delight in itself, and a chosen paradise for twenty or thirty treasures. You have only to pick out four (or three) specially chosen blocks of mountain-limestone, set them corner to corner, best side outwards, so that there is a well in the centre. Put at the bottom (excavate a further depth perhaps if necessary) 6 or 7 inches of very rough drainage, fill up with moraine mixture : and there, lo and behold, you've got a perfect miniature garden, with the added advantage of having it closer to the eye and hand than any ordinary moraine ; and a self-contained paradise of charm, complete and independent. For suddenly the thing has become one huge lonely boulder, with exquisite flowers abloom in the shallow depression of its top, and others eddying round the foot of its stern cliffs. This, it is obvious, you can put down anywhere, and in any and all surroundings it will always be a beautiful picture, satisfying in itself.

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The moraine, big or little, is an unending joy ; its possibilities are as yet unplumbed. Each separate moraine, in fact, will have its own special pleasures and glad surprises. The only caution that I have to enter as to all my cultural prescriptions, is this : I shall never indeed call a difficult plant easy, nor an easy one difficult ; but, remember that *I write from an Alpine climate*. Therefore allowances must be made for the difference between my circumstances and those of South or East. Thus, when I talk of coolness or moisture, the Southerner will probably do well to underline my remarks in his mind, and multiply them by two, and take precautions accordingly. On the other hand, if ever I talk of doubtful hardiness, or a passion for warmth and dryness, the Southerner will know he can go forward with that species a great deal more happily than I.

The rest of this book shall be devoted then to a very cursory glance over some of the most beautiful species that may glorify this rock-garden you have now duly and correctly built. All the plants mentioned (except where special notes are given) are of perfectly sound constitution and easy culture in any fair place and any clean, well-drained soil. I am going to give you rare and precious species, though, as well as common, cheap, robust ones ; for my aim is to tempt you insidiously on from triumph to further and more ambitious triumph, and so help you, if I can, from rung to rung of the great ladder that climbs the difficult and dizzying heights of horticulture, to where, in the very topmost peak of your ambition, bloom aged clumps of *Eritrichium nanum*.

But I can claim to give you no special and no infallible

rules or recipes for success ; each district, each climate, has its own peculiar possibilities and trials. You can only be certain as to fundamental guiding lines ; if I say "likes rock" or "a cool exposure" you may be confident that I speak universal words, although in your own garden you *may* be lucky enough to find a plant of that same species is quite happy in full soil and blazing sun. The more experienced a gardener grows, the more deeply does he come to realize the impossibility of prophesying certainties, but the more sure does he also on the other hand become, in foreseeing reasonable probabilities. And that is all I claim to do. The plants themselves will teach you the rest. Real knowledge is always a first-hand article. But as for books upon the subject, I should be an idiot if I didn't urge you specially to read my own. And there are others.

CHAPTER IV

BUTTERCUPS, ANEMONES AND COLUMBINES

THE Alpine Buttercups form a singularly beautiful and attractive group of little plants, usually not more than 4 inches high. They are also quite the heartiest of high Alpines in cultivation, so long as it is remembered that they dislike a parching air or soil, and refuse to be crowded up in coarse rubbish. They are plants of the upper rocks, shingles and stone-slopes, and depend on the abundant moisture of the melting snow at growing time, in the silt where they dwell.

Ranunculus alpestris is the most universal species, and

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abounds on almost all the limestone ranges at considerable elevations. In damp, rich soil, or in wet moraine, it forms ever increasing tufts in the garden of lovely little glossy trifoliated leaves, and profusely bears its golden-eyed cups of snowy-white from March to November without a pause. Division of the crowns in September. (*R. Traunfellneri* seem a development from the Eastern Alps.) *R. alpestris* is at once the daintest, easiest and most robust of the high Alpines, but, of course, like the rest of its kin is a fine jewel, and must not be parched or smothered.

R. anemonoeides (or *Callianthemum anemonoeides*) is very rare indeed in cultivation, though quite easy to grow in any free, open soil in a good place. Immense flowers like rosy Apennine Anemones, produced on short stems in April, before the glaucous ferny leaves unfold. A comparatively lowland species, from wet places in Austrian pine woods. Division of the rapidly increasing tufts.

Almost identical in size of flower, but much smaller in habit and frailer in increase, is its Alpine variety *R. an. Kernerianus*, which occupies all the grassy turf along the ridge of Mte. Baldo. *R. Kernerianus*, rarer in nature, is commoner in cultivation than *R. anemonoeides*, and no less amenable and charming.

R. crenatus has kidney-shaped, almost evergreen leaves, but is otherwise a twin to *R. alpestris* (is identical with *R. bilobus*). It is very rare, but perfectly easy, if treated in the same way. In fact it is even less dependent on moraine; both species show pure and lovely in any moist, rich soil. Lombard limestones.

R. glacialis is the highest of our European Alpines,

ascending to 14,000 feet on the Finsteraarhorn. This is the typical universal plant of the topmost granite shingles in wet hollows. Very fat, grey fleshy leaves, finely divided, and immense flowers, on 6-inch stems, snow-white on opening, and fading after fertilisation to a rich pink. This plant thrives well in wet moraine, and is quite surprisingly easy to grow, indeed, in any heavy, sticky, moist loam, with stones. Division.

The limestone variety of this is *R. Seguieri*, which replaces *R. glacialis* in the Dolomites. This is frailer and dwarfer in habit, and forms a loosely ramifying colony, not in damp stone-slides, but in open, drier places, in a fine white limestone silt that cakes to a consistency like rock. Its leaves are less succulent, finer, bright green : its enormous flowers are always of the purest white. It is far too rare in the garden, as it thrives robustly in any good calcareous loam or moraine. Division.

R. gramineus is a taller species from the Alpine turf of the Maritime Alps. About a foot high, narrow bluish leaves, and big flowers of rich gold. Exactly similar, but lovelier even, is *R. pyrenæus*, of the purest, pearliest white ; and *R. amplexicaulis*, yet lovelier again, is from the Pyrenees, with larger snowy flowers, and stem-embracing blue-grey leaves. These will succeed brilliantly in any full, cool loam, rather rich, in sun. *R. aconitifolius* and *R. platanifolius*, from damp Alpine meadows, are indispensable bog-border plants, growing to 2 or 3 feet, with airy showers of white blossom. *R. Lyallii* is the New Zealand *R. glacialis*, and is hard to cultivate even in its native land. It has round, glossy leaves, and enormous white flowers, and requires a torrid summer

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in moist Alpine mould, and a frozen bone-dry winter. In England I believe it to be impossible. Hardly, if at all, less gloomy, is one's foreboding as to other New Zealanders, its golden cousins, *R. insignis* and *R. Enysii*.

While of the remaining yellow Buttercups perhaps the best is *R. Nyssanus*, for any rough corner, cool or hot, running madly about, with abundance of golden flowers on foot-high stems.

R. parnassifolius.—This is another of the delectable white mountain Buttercups of Europe. It is a rare plant, from high water-logged silt-pans and ridges of the limestone ranges, growing often in ground like heavy white clay. Glossy, dark-green, heart-shaped leaves, edged with crimson, and immense pure white flowers on stems that tend to hug the earth. Quite hearty and easy in any good, cool, limy soil, in pocket or moraine: but be sure and get the *real*-flowered variety, as there are several very disappointing forms, one of which usually has only two perfect petals, and the other no petals at all.

R. uniflorus is a rare treasure, quite easy and vigorous, suggesting a stouter, coarsened *R. alpestris*, with creamy flowers, one to a stem. Division.

R. Thora and *R. pythora* are sometimes asked after. These are little plants of high stony slopes on limestone. To a single stem each carries a crenate greyish leaf, and then a small yellow star or two, rather minute and mean.

R. rutaefolius (or *Callianthemum*) is a rare turf plant, of very easy culture and vigorous habit, about 8 inches high, with ferny glaucous leaves, and rather small flowers with a green eye and a chill tone. It is like a much coarsened paper-white *R. anemonoides*. Mt. Cenis, Schlern, Pasterze, &c.

Of Anemones for the rock-garden, there is a noble

army. In the first place, for shady, cool, moist aspects, in rich soil, there is generous *A. sylvestris*, running freely about all over the place in any cool soil, and sending up, in May and October, great nodding white flowers on foot-high stems. But be quite sure always to get the lavish flowering form, called *A. sylvestris major*. Then comes the great group of Wood Anemones, *A. nemorosa* in its many forms, of which the Blue Allenii, Blue Bonnet, Celestial, and *Robinsoniana* are among the loveliest of our flowers. *A. ranunculoides* is like a golden Wood Anemone, and *A. trifolia* is an Alpine Wood Anemone from the Dolomites and Southern hills. *A. Hepatica* forms another group, with many coloured forms, single or double; and many coloured forms also of its giant development *A. angulosa*. These last are all lovers of rich woodland, do not seed, do not like being moved, and detest being divided. They must be let alone, and allowed to grow on into vast clumps.

Now we pass into the higher woodland scrub, and the lowest Alpine pastures. Here Europe gives us but one species, charming *A. narcissiflora*, silky-leaved, about a foot high, with heads of flower in shape and size and colouring exactly like Apple blossom. This is one of the easiest of plants to grow in any rich soil. This group, however, belongs essentially to the high copses of Asia: the charm and vigour of *A. narcissiflora* are almost precisely repeated by *A. polianthes* and *A. demissa*, treasures new or rare. Division of crowns.

We are on the Alp now, out in the open. These bare downs are the Paradise of Anemone the whole world over. Glorious *A. Coronaria* of the Mediterranean basin, scarlet or violet, is not universally a success. It is a mimp, but a royal beauty, if you can do it, in hot rich soil. The same applies to *A. fulgens* and *A. stellata*. *A. apennina* is

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really a woodlander—a sapphire galaxy ; but I include it at this point as it is so exactly echoed by *A. blanda*, tinier in growth but bigger flowered, which makes all the Greek Islands an Archipelago of colour in spring. This is an easy indestructible joy ; here it thrives prodigiously on banks in which afterwards Epimediums grow rank and conceal the death-bed of the Anemones. My one undoubted treasure from America is *A. pennsylvanica* or *dichotoma*, which ramps fearfully in any rough sunny place, but is delightful in summer, with its medium sized cream-white flowers on foot-high stems above handsome foliage.

To one group belong *A. Pulsatilla*, *A. Halleri*, *A. pratensis*, and *A. patens*. They grow to about a foot or less, with ferny foliage and single stemmed heads of huge silky violet (occasionally white or yellow) flowers in spring. They thrive well in any open loam. *A. Halleri* is the rarest. Seed. Rarer still are *A. Burseriana*, *A. amœna*, and *A. albana*, which lead on to the giants of the Alps, *A. alpina* and *A. a. sulfurea*. These glories make huge ferny bushes 3 feet high, in any very deep, rich, sunny loam (they have prodigious root-trunks), and carry, on single stems, as many as fifty enormous flowers, snowy or saffron, that are only not *quite* so enormous as they are on the Alps. Seed. In nature *A. a. sulfurea* is supposed to be only found on granite, while *A. alpina* is indifferent. This indifference is shown by both plants in the garden.

Now only remain the two high Alpines, *A. baldensis* and *A. vernalis*. *A. baldensis* is a rampageous spreader wherever it occurs, in stony sunny slopes in the Lombard limestones, with wide mats of low fine leaves and rather sparse foot-high, single-flowered stems that carry big, golden-eyed Chrysanthemums. Contrary to one's expectation, *A. baldensis* appears to be difficult to cultivate. I

advise moraine, but have never yet really succeeded with the plant. *A. vernalis* belongs as essentially to the Northern as *A. baldensis* to the Southern ranges, and is universal in the highest turf of the Central Alps. It is a Pulsatilla-cousin with leaves that hug the ground, and enormous flowers of pearly white, shimmering with a golden and lilac iridescence of silky fur. These flowers sit flat on the ground when they open, and are the most startling of marvels on the barren brown moor, the first heralds of spring to appear as the snow begins to melt. *A. vernalis* is perfectly easy and robust in any solid rich loam in full sun. Unfortunately its flowers seem to become smaller and less brilliant in cultivation. Also, alone of its race, it never drops its sepals, but ends by looking disreputably ugly, with a blowzy withered head at the top of the lengthened stem. Seed, or division of established clumps.

The Columbines have such a bad name that all who are not candidates for bankruptcy or despair had best avoid many of them altogether—many, at least, except *Aquilegia glandulosa*, *A. vulgaris*, and the glorious hybrids of *A. coerulea*. The easy ones thrive well in any cool place or border, but for the many others a very spongy, rich woodland mixture, deep and sweet and fresh, must be prepared in some corner where they will never be parched by sun or worried by wind. *A. pyrenaica* is quite easy in a choice spot (it is a smaller, darker *A. alpina*). *A. glandulosa*, the most magnificent snow-and-sapphire splendour of the lot, if moved in spring, is quite robust in a rich vegetable loam fully exposed. *A. coerulea* is more delicate, alike in constitution and in charm; but its hybrids are as lovely, and five times as hearty: *A. canadensis*, and the other red-yellow species, are very stout almost anywhere as a rule; *A. Reuteri* is excessively rare and

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unproven, a miniature, clear-blue *A. alpina*: *A. Haenkeana* and *Einseleana* are much darker; *A. Stuartii* and *A. Heleneæ* are noble hybrids of *A. coerulea* and *A. glandulosa*, but seem no more safely permanent than *coerulea*, and not as regal as *glandulosa*. *A. ecalcarata* is quite easy, and has weird, spurless pendent flowers of a warm burnt sienna. Easy, too, are *A. flabellata*, a waxy-white (or mauve and white) little beauty from Japan, and *A. olympica*, which has the same texture, but is taller; but the Royalty of the Southern Alps, the rarity of Switzerland, imperial great *A. alpina*, quite certainly loses its huge size in cultivation, and its dazzling blue colouring sinks into a steely indigo. The Columbines can, of course, be raised profusely from seed, but most species shamelessly interbreed, so that you can never foretell their progeny. So far as my experience goes, however, *A. ecalcarata*, *A. flabellata*, *A. olympica*, and, above all, *A. glandulosa*, can always be relied on to breed absolutely true. No catalogue of seed, commercial or botanical, can ever dare to be confident about *Aquilegia alpina*. Or so I have universally found.

CHAPTER V

CRUCIFERS AND POPPIES

NO one will want long ecstasies over the hybrid Aubrietias. For, in one word, they are indispensable, alike for great gardens or small—sheets of dazzling colour in any poor and sunny soil. They can be endlessly propagated by cuttings and division: the best method is to buy a packet of seed from some champion strain; you may then be sure of getting some forms as good as the very best of

named ones—Leichtlinii (crimson), Moerheimii, Dr. Mules, Fire King (weakly), Craven Gem, Lavender, Purple Robe, and Prichard's Ar. The Aubrietias are everybody's plants. So are the Alyssums, which, however, make bushes rather than ramp: *A. maritimum* is a sweet-scented small white one: the best ones are yellow,—*A. saxatile*, *A. sax. citrinum*, *A. sax. plenum*, *A. argenteum*, *A. gemonense*: neater, smaller and choicer, but no less indestructibly easy, are the Alpine species, *A. alpestre*, *A. idaeum*, *A. Wulfenianum* and *A. montanum*. The Arabises, with the exception of rather miffy pink things for warm sandy soil, are chiefly known as coarse, terrifying (but invaluable) rampers, in *A. albida* and *A. alb. plena*. These are indestructible everywhere, and of more value than the rest, as no one who has Aubrietias wants a pallid little imitation in some feeble *Arabis*. *A. petraea* is like a small *albida*. *A. Sturii* is a neat, tiny Alpine. *A. lucida variegata* has a dainty glossy charm in its foliage. *Parrya Menziesii* is like a rather coarse, sub-shrubby, purple Aubrietia; and *Hutchinsia alpina* is an invaluable little sheeter, with ferny leaves, and spikes of white, for any sort of corner, but preferably in a cool place.

Our best Drabas are all Alpines, and high Alpines, usually little golden-flowered cushions for moraine or a choice shelf. The best are *D. armata*, *D. scabra*, *D. acaulis*, *D. rigida*, *D. Ferdinandi Coburgi*, very tiny and compact: *D. olympica hetericoma*, *D. dicranoides*, *D. aeizoeides*, *D. Sündermannii*, not quite so tiny but no less dainty and neat and charming. The jewel, however, of this group, is exquisite *Petrocallis pyrenaica*, sometimes called *Draba pyrenaica*. This easily and permanently glorifies a moraine, or a very stony, limy place, forming

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close cushions of fringy-fine leaves, densely packed and hidden with stemless flowers of a soft lilac-pink, delightfully fragrant. Southern Alps. Division. Seed, for all Drabas.

Iberis and Aethionema come close together. *I. correæfolia*, *semperflorens* and *semperfiriens*, are huge, rampageous masses of evergreen foliage, with prodigal drifts of snowy blossom. They grow anywhere, seed profusely, and strike from any fragment, stuck in anyhow. *I. pinnata* and *I. Little Gem*, and *I. Snowflake*, are neater little bushes, no less robust; *I. saxatilis* is much choicer, a gem for moraine; *I. stylosa* (*Nocceæa*) and *I. petræa* are very dainty little Alpines—*I. petræa* being prostrate, like a minute Yew, with heads of white. This likes a cool, select corner rather better, I fancy, than moraine.

The Aethionemas are lovers of sun and lime—blue-leaved bushes, with spires of, usually, soft bright pink flowers. They are very easy, and come profusely from seed. The biggest is *Ae. grandiflorum*. Then come *Ae. cordatum* (*Eunomia*, pale yellow), *coridifolium* (*Iberis jucunda*, a jewel), *armenum* (exquisite and prostrate), *pulchellum*, *Antitaurus*, *rotundifolium* (delightful), and *saxatile*. *Ae. Thomasianum* and *Ae. cappadocicum* are worthless. Of Erysimums, *E. pumilum* is a quite dwarf, neat, citron-yellow Wallflower of easy cultivation in soil or moraine: *E. purpureum* is a dainty lilac charmer for moraine: *E. ochroleucum* is a rampant dwarf spreader, growing anywhere, with sheets of pale yellow bloom: *E. comatum* is a Servian species with big saffron-coloured flowers and fine foliage propagated by seed. (Seed also for the Wallflowers, and for the lovely orange-coloured *Cheiranthus Allionii*.) The Matthiolas are the Wild Stocks: of these *tristis* and *vallesiaca* are lovely little quaker-coloured treasures of

PLATE IV
SAXIFRAGA COCHLEARIS



the moraine, and deliciously fragrant at night. Nor must anyone omit tidy *Cardamine trifolia* from some shady corner, with heads of big white blossom hovering over spreading masses of dark leaves. Division.

Morisia hypogaea is a much cultivated bank-side Crucifer from Corsica, perfectly hardy and vigorous, increasing its neat dwarf tuft freely in any light, warm loam, forming a cluster of evergreen leaves like *Asplenium Trichomanes*, amid which sit singly, for months together, large golden flowers. Cuttings. Keep this in poorish soil, as it loses much of its charm if it is allowed to grow blowzy from excess of nourishment. The *Thlaspis*, on the contrary, can never grow vulgar, and are the most precious and charming of high Alpines from the lonely shingles. They are very good-natured, but almost demand moraine for their fullest possibilities of health and beauty. *T. cepae-folium* is small and frail, with fat leaves, and fragrant heads of purple. *T. rotundifolium* is universal in the high limestone scree, and is one of the loveliest of all Alpines, forming a tight tussock, 6 inches across, among the stones, literally hidden by packed heads of large fragrant lilac-flowers. No less wonderful, easy, and generous, is the much rarer *T. limosellæfolium* from granitic slopes of the Maritime Alps. This is a little more robust than the last, insists less rigidly on shingle, may grow an inch or two taller, and has rather larger flowers, of a warmer pinky-lilac, deliciously sweet. Both these treasures thrive with equal robustness in any sunny moraine, whether of lime or granite. These, and *Petrocallis*, are the choice jewels in their dull family. (Cuttings, and occasionally seed.)

Meconopsis is a cruel and tantalising race. One species only is a European, and this is as easy a plant as any alive.

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It is the Welsh Poppy, whose lemony flowers will be valuable to you, if you contemplate an Almond Pudding rock-garden, as being the only things that will appear there. There is also a splendid orange form, and two doubles, a fiery scarlet and a golden, neither of which is so ugly as you would expect. Seed for these. All the rest of any moment are Asiatics and Himalayans, from very high places, desperately beautiful, and no less desperately difficult. A cool corner, perfectly drained, but kept well damped in earth and air alike; a soil compounded of sand, leaf-mould, shredded peat, old loam, and charcoal, offer your best hope of adoring *M. aculeata*, *M. bella*, and the many other marvellous sky-blue Poppies of China and Thibet. Most of these beauties, though, have a horrible habit of invariably dying after they have flowered (if you ever get so far). With all these blue Poppies, be sure to get and keep a good strain, for they vary to hideous shades of lilac and slate-colour. Seed.

True Poppies give us one priceless beauty in little *Papaver alpinum*, with flowers that range from white through soft yellows to a very sweet salmon-pink; *Burserianum* and *rhæticum* are forms of *P. alpinum*, which is perfectly happy in the garden, but most beautiful and most certainly perennial in a moraine, as it dreads imperfect drainage and clogged ground in winter. Apparently distinct, but not botanically so, is the much bigger Iceland Poppy, which is indestructibly gorgeous anywhere, as also in choicer rocks is *P. croceum*. In annual and biennial Poppies this book shall take no stock; but *P. tauricola* is like a russet *Meconopsis Wallichii*, and quite new *P. triniæfolium* has hispid silver leaves of a rare loveliness.

CHAPTER VI

PINKS AND PANSIES

ALMOST all of the Pink tribe are sun-lovers, for clean warm loam, rather light. Almost all may be propagated from cuttings and almost all grow well from seed. Of *Dianthus* itself, by far the most universally valuable for the rock-garden is *D. alpinus*, for limy loam or moraine, gloriously beautiful, forming evergreen masses, glossy and dwarf, with huge single flowers, glowing rose, on 2-inch stems, from the Austrian limestones: then comes *D. neglectus*, from high turf of the S.-Western ranges, quite grass-like, attaining 3 or 4 inches, with big flowers of a dazzling carmine, washed with buff on the reverse. Open soil: it dislikes moraine with me. *D. cæsius* and *D. suavis* form masses, big and large, of blue grass; with innumerable fragrant pink flowers, each on a 6-inch stem. Anywhere in sun. *D. glacialis* (choice and capricious, with glossy leaves and big rosy flowers, solitary on 2-inch stalks), from high turf in the Eastern ranges on granite, thrives in moraine, as do its exquisite miniatures and cousins, *D. microlepis*, *D. Freynii*, *D. Lereschei*: these are so small as to have the look of wee Thornyfields—those lovely silver-spiny Acantholeimons, or Prickly Thrifts, from the Levant, which thrive so freely, and so freely throw up their arching 6-inch plumes of big pink or white flowers, in any hot, well drained and limy loam. (The best are *A. glumaceum*, *A. venustum*, *A. androsaceum*, *A. quinquefolium*, *A. Fominii*, *A. lepturoeides* and *A. Hohenackeri*.)

D. callizonus is a rare treasure from Transylvania with bluish leaves, 2-inch stems and enormous crimson, crimson-

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spotted flowers. It runs about in a cool vegetable soil, stony, peaty, *not too sunny*. It is not difficult, but needs consideration, and repays it. *D. frigidus* is quite dwarf, with big pink flowers on 3-inch stems : *D. calalpinus*, a choice but not very clear hybrid of *D. alpinus* and *D. callizonus*, is as easy as *D. alpinus* : *D. deltoeides*—the Maiden Pink—trails profusely about in any sunny place, with a profusion of little rose-crimson (or white) flowers (*D. graniticus* seems akin to this). *D. squarrosus* makes mats of grey grass and 5-inch stems of large white flowers, intensely sweet, and heavily fringed : *D. dentosus*, the Amoor Pink, is hardly known as yet, but has purplish flowers with a dark eye. *D. nitidus* seems like a smaller *D. alpinus* : *D. arvernensis* is a tiny, very compact form of *D. caesius* : and *D. sylvestris* is a glory of hot Alpine banks, attaining to 8 inches or more, with big rosy or white flowers on graceful single stems.

All these, with the exception of *D. glacialis* and *D. callizonus*, are everybody's plants. And all are specially precious for the moraine, which is essential to the beauty and habit of the tiny species round *D. glacialis*. No garden however will try to dispense, on bolder rocks, with larger Pinks, such as fringy sweet *Dianthus superbus*, *D. arenarius*, *D. gallicus*, *D. zonatus*, and the many great and noble peacock-eyed single seedlings of *D. Caryophyllus*. But be very careful to avoid the dull and dowdy Clusterheads, with microscopic flowers bunched tight at the top of gawky naked stems : of such are *D. Carthusianorum* and *D. atrorubens*. And above all take pains completely to eschew the squawking carmine podginess of such double hybrid Sweet Williamish affairs as *D. Fürst Bismarck*, *Atkinsonii*, *Emilie Paré*, and *Napoleon III*.—dumpy in habit, vulgar in colour, and very miffy in constitution.

The Sandworts are of easiest culture, and, failing seed, must be pulled to pieces for propagation. *Arenaria montana* falls in sheets down any sunny rock, half hidden by its abundance of shilling-large flowers: *A. laricifolia* makes sheets of pine-like verdure, with big blossoms on fine wiry stems: *A. cæspitosa* is much smaller—a white-starred carpet, of which, in turn, tufted *A. verna* is a further reduction, though with better flowers. Tinier yet is *A. balearica*, which creeps by the yard like a lichen over any cool rock or wall in sun or shade, with thousands of white flowers. This species seeds itself, and although so minute, has a way of throttling choicer things if it has a chance. And our only exception to the whiteness of the race is *A. purpurascens*, forming neat little glossy masses, thick-set with stars of delicate lilac. Cuttings. Close to *Arenaria* comes *Cerastium*: of the Chickweeds, *C. latifolium* is a high-alpine and only for the moraine, with broad soft leaves and very large flowers. The best of the others are devastating rampers, even rare *C. Columnæ*, while more useful and terrible weeds were never invented than *C. repens*, *C. Biebersteinii*, and *C. tomentosum*. You need not ask how to multiply them. They'll look after that for themselves.

The Alpine Saponarias give us some lovely dwarf cushion-plants of very easy culture in light sunny soil or moraine. Of such are *S. pulvinaris*, *S. cæspitosa*, *S. Wiemanniana*, and *S. Sündermannii*—all with tufted habit and soft pink flowers. And *Saponaria ocymoeides*, with its varieties *alba* and *splendidissima*, is an indispensable plant for any sunny garden, falling down over hot banks and boulders anywhere, in sheets and hanging curtains of small, bright pink blossom. Southern and Eastern Alps, limestone or granite; it stains whole miles of débris-slope in the Enga-

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dine. Cuttings or seed. *S. lutea* of the Mt. Cenis is a rather ugly, miffy little curiosity with clustered heads of black-anthered, straw-yellow flowers.

Lychnis offers the rock-garden *L. alpina* for any cool spot, about 4 inches high, with heads of rosy blossom; *L. Flos-jovis* grows about 18 inches, with silver-fluffy silky leaves, and heads of big carmine flowers. And the best of this race for our purpose is *L. Lagascæ* (or *Petrocoptis Lagascæ*) from Pyrenean cliff-chinks, fine and frail in habit, with rosy flowers. This treasure wants care, and a select, well-drained nook, if it is to endure for very long. Much the same, but white-flowered, is *L. pyrenaica*, with a variety *grandiflora*. Seed for all these.

Far more generally important are the *Gypsophilas*, of which *G. repens* is priceless, being indestructibly easy, hardy and robust, swathing your ground or cliff in long draperies and mounds of narrow glaucous leaves, thick-set with sprays of pearl-pink stars all summer through. Universal on the Alps, in the shingle. Invaluable for moraine (not near choice treasures) or anywhere else, in any sort of soil, aspect and position. Seed, or cuttings. *G. Sündermannii* is a rather less rampageous, neater treasure of the same kidney, and *G. cerastioeides* a quite small compact jewel for the rock-work. And another kindred thing of very special value is *Tunica Saxifraga*, which ranges up from the Mediterranean coast throughout the Southern Alps. It grows like a weed on any rock-work, in sun or shade, in any poorish soil, and lives for ever, forming from year to year a widening tuft of emerald fur, from which, from May to November, there springs on wiry fine stems of 8 inches or so, an incalculable number of delicious pink (or white) flowers, hovering in a cloud over the clump beneath. (Seed.)

Silene starts with a warning. Do not trouble about

S. acaulis. It may grow well in soil or moraine, but it rarely if ever flowers as it should—and as it does on the Alps, producing mats of sheer colour that simply force one to pluck it up and bring it home. *S. alpestris*, however, is a first-quality treasure, ramifying freely in any cool, rough corner, and producing its 8-inch showers of white, notched flowers through the whole summer. *S. pusilla* is a miniature of this, a thing of unimaginable daintiness and charm, only about 3 inches high, and perfectly happy in any cool dank chink on the North side of your rocks. Seed for both these. Eastern Alps. *S. Zawadskyi* has handsome Primulish rosettes and poor white flowers : *S. Schafæ* is a cheerful little robust plant for anywhere, forming a 6-inch bush of magenta-rosy flowers, big and brilliant, through all the autumn months. *S. maritima* (with a pallid pink form, and a double) is an English native, easy, dwarf, and robust, which has its value. *S. Pumilio* from tight cushions sends up fine flowers like a crimson-rose Carnation. Eastern Alps, always on igneous rock. It is difficult, unfortunately, hating lime, and requiring a deep, moist and stony peaty humus, with perfect drainage. Fortunately the even more splendid *S. Elizabethæ* is perfectly easy, and specially glorious in any moraine, cool or sunny. Close tufts of glossy, bright green pointed leaves, and then 6-inch stems, arching out and up like a swan's neck, with one or two enormous flowers like a great rosy Clarkia, with flopping petals (*Melandryum Elizabethæ* of those who crave to be up-to-date). Rare : limestone Alps of Lombardy, in stony or gravelly places, river-beds, &c., for preference on cooler northerly exposures. Seed.

Violas for the rock-garden fall obviously into the two groups of Violets and Pansies. Of the first, *Viola Sororia*, *V. stricta*, *V. cucullata* and similar species call for little

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comment. They are all excellent robust Violets to fill any odd corner. But *Viola biflora*, the little tiny-flowered golden Violet of the Alps, is a different matter. This jewel is perfectly easy and happy ; it enjoys running about in some cool, moist and loose soil in a shady place ; its yellow flowers are like sparks of sunlight there. Division. *Viola cornuta* stands halfway between Pansy and Violet ; an invaluable old border plant, large and ramping, with sheets of blue or white flowers through the summer ; finely adorning any poor, unconsidered place. It has lovelier forms called *Papilio*, and a hybrid with *gracilis* called Purple Robe, which is perpetual-blooming, but has quite lost the extraordinary glory and charm of *Viola gracilis*. For this is a beauty above all beauties, forming big masses in any warm, rich soil, with profusion, on 5 or 6-inch stems in early summer, of tweaked great flowers, of a dark imperial violet, like velvet, exquisitely fragrant. Then comes our own native Alpine Pansy, *Viola lutea*, with many colour forms from white to purple, invaluable vigorous in any fair place; followed by various *Viola* hybrids, notably a queer little thing of very free growth, called Bowles' Black, with small flowers of black velvet look ; and finally, *the Alpine Pansy*, *Viola calcarata*, which is, for no discoverable reason, rare in gardens. And yet it is a very vigorous grower in a free open soil ; perfectly neat, dwarf, and hardy, and royally generous with its large noble Pansies, in every shade from snowy white and citron yellow, through every sort of freakish and fantasy, to the richest violet. It is universal in the high Alpine turf, and a garden joy of special merit. For all these Pansies, cuttings.

Viola bosniaca is a novelty of remarkable beauty like an erect *Viola lutea*, with flowers of a hot amethyst. It seems perfectly easy, as also does an only less charming

cousin, *V. latisepala*. But *Viola pinnata* is difficult, and demands stony calcareous ground in a cool place. It is rare in the European limestone Alps—a cloven-leaved frail thing, with sweet pale-purple blossoms. It has a Japanese form in the woods at Nikko, one of the loveliest Violets I have ever seen. But never yet have I succeeded in getting living plants of *V. pinnata chaerophylloides*. Another difficult *Viola* (even in its own country) is its American cousin, *V. pedata*, perfectly beautiful, with deeply divided leaves, and many big lavender flowers on 6-inch stems. In one form, *bicolor*, the two upper petals are of rich purple; the form *alba* is pure white. I can only prescribe the treatment that seems to answer here—that is, unadulterated sand in full sun. In less Alpine districts, no doubt, a moister and cooler corner is indicated, and an admixture (not a large one) of some richer medium with the sand.

We now pass upwards to the challenging *Violas* of the highest shingles. With one exception these are all Pansies, and, with no exception, they are grim and difficult to grow. I must, however, give the benefit of the doubt to *Viola alpina*, a species almost unknown hitherto in cultivation, which replaces *V. calcarata* in the high turf of the Austrian limestones exactly as, in the same sod, *Campanula alpina* replaces *C. barbata*. *Viola alpina* is a single-crowned species with profusion of glorious purple Pansies. And, as a turf plant, it has no right to prove any more difficult than *V. calcarata*.

But *Viola cenisia*, *V. Comollia*, *V. heterophylla*, and *V. valderia* seem all to be both miffs and mimps. They are confined to the very coarsest moraines and shingles of the Alps. They ramify wildly among the boulders, never grow in finer debris, and are a despair to collect. They

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are marvellously beautiful, however, great purple (or wine-red) short-stemmed Pansies ; no effort is more than they deserve. But only moraine culture offers, I believe, any real hope of success with them. *V. valderia*, indeed, ought to be the easiest ; it is a tufted, non-ramifying *cenisia* from much lower elevations. But I have not yet had any good results from it, any more than from *V. heterophylla*, which offers one as fair a delusion of hope, by occurring in stony, open patches among the highest turf of the Lombard Alps.

Last, newest, rarest and most august of this group is *Viola nummulariaefolia*. This is a species peculiar to granite shingles very high up in the Maritime Alps, and to a few similar stations in Corsica. It is a Violet, not a Pansy, running freely about among the coarse square blocks, with shoots of tiny, heart-shaped leaves, and abundance of round little Violet faces of a soft blue lavender, freaked with delicate lines of purple velvet. It is an exquisite beauty, and, though devastatingly difficult to collect, has so far made no bones with me about growing and thriving even excessively in pure sand or rather soil-ful moraine. This, and the other shingle Violas, will probably appreciate being kept rather specially dry in winter, and moist in spring.

CHAPTER VII

SAXIFRAGA

A CURSORY, NOT A CRITICAL, SKETCH

ONE might almost say that the rock-garden exists by dint of Saxifrages alone, so predominantly important is

this family. It is one of enormous size and range, almost invariably temperate, Alpine, or sub-Alpine in its needs. Its general average of brilliancy is not, perhaps, quite so high as that of *Primula* or *Campanula*; but in usefulness, garden value, vigour, ease, and solid attractions the *Saxifrages* attain an average so exalted as to leave every other race far down in the valley. *Saxifraga* is divided into sixteen subsections: in many of these the members are uglies or woodlanders; so that only five of the classes need concern us here. First and foremost comes that of the *Euaeizōns*, by far the most important for the ordinary rock-garden. These are all the silver or encrusted *Saxifrages*: and, please, in so thinking of them, for ever conspue that detestable affectation of "Rockfoil"; plain "Saxifrage" is quite as good English as any one can want.

The encrusted or Silver *Saxifrages* then (typified by *S. aeizōn*) make up a race so far ahead of every other in general value that a rock-garden can be glorious with nothing else, and without them could not be really glorious at all. They form wide masses, heaps and carpets of broad-leaved, silver-edged rosettes over your rock-work. They will grow robustly in any decent soil, whether limy or no, without any rock whatever, but are equally fine, more safely drained, and even more fitting, among the boulders. They thrive in moraine and look lovely, but of course it is not necessary to them, nor they to it. They markedly appreciate full sun, but are most of them quite reasonably happy on a cooler exposure, so long as it is not dank or waterlogged. They are prodigiously free of their tall loose sheaves of white blossom in June: and of seed too, which germinates abundantly on a moss-cushion. But you can best save

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your time by plucking off a rosette at almost any moist moment (especially September) and sticking it in anywhere. It will be sure to grow. And they are absolutely slug-proof.

These remarks apply quite as forcibly to the next section, the Dactyloid, or Mossy Saxifrages : their moss-like foliage is no less vivid and beautiful in winter than the silver-beaded rosettes of the first section. The Mossies, however, being mostly woodland, sub-alpine species, though the most rampageous of indestructible plants anywhere in full sun, can also bear a cooler and shadier exposure with much greater joy. They are profuse with their big flowers of white or pink on tall bare stems in May and June. The type is *S. hypnoeides* : and their least fragment grows, if merely poked into a bed.

The next section takes us higher up on to the bare mountain rocks. The Kabschia Saxifrages are the brilliant jewels of their race, neat little compact domes of hard, horny leaves, like scales, and large brilliant flowers of white or gold, on three-inch stems ; and they flower between the beginning of March and the end of May. None of these treasures are really difficult, but being so small and lovely, they like, and ask for, special care. They seem all by nature lime lovers (like almost all Silvers ; the Mossies have no fads in the matter), and in varying degrees they resent a too torrid sun and soil. Cool, light, and limy loam best suits them, in an open corner of the rock-work, where some shoulder of a block may perhaps only allow them six hours or so of sunshine. They thrive very freely in the finer parts of the moraine, and, like the encrusted Saxifrages, are forearmed against a reasonable amount of drought : they cannot bear ill-drained waterlogged soil. These shining beauties

do seed, but are best propagated by careful division, or cuttings, in April, or the end of August. *S. caesia* is their commonest type.

All this applies also to the Englerias, which have fat, silver rosettes, and 6-inch spikes of, usually, red flowers, very tiny, hanging down in conspicuous fluffy claret-coloured calyces. These are raised from seed, or division. They belong, one to the Pyrenees, and the rest to the Eastern ranges, and are, therefore, more dependent on sun and perfect drainage. *S. Grisebachii* is their best known representative. Now, not classifying a few isolated species, we come to the Porphyrians : our own *Sax. oppositifolia* is their type. They are prostrate species, with large stemless flowers of rosy purple in March and April. They are also high Alpines : and all *insist* on a cool vegetable soil, perfectly drained, in a not too sunny corner, with abundance of water in spring. Division.

With these rules, *cultural details will only be given where specially needed for some particular species.*

THE EUAEIZÖON SAXIFRAGES

Saxifraga aeizōon is the universal type-silver, forming wide tumbles of its rosettes, anywhere, with profusion of cream-white flowers on 6-inch stems. There is, in point of fact, no such thing as *S. aeizōon* : the name covers an infinite number of variations. The confusion in catalogues is appalling. The best of the larger Aeizōons, averaging 8 or 10 inches, are *S. aeizōon cartilaginea*, *Portæ, californica*, *altissima*, *elongata*, *cultrata* (*major* or *Malyi*), *dubia*, *rosularis*, *thyrsiflora*. Most of these, as of the smaller ones, are given in catalogues as true species. Two smaller forms are *læta* (*Stabiana*) and *notata* (*Sturmiana* of

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catalogues) : tiny lovely neat miniatures are *minima*, *baldensis* (Farrer), *lagraveana*, *pusilla* and *labradorica*. *S. aeizōon paradoxum* is probably a hybrid : it has long thin leaves, iron-grey and silver, very beautiful, but inferior flowers (*S. circinata* and *S. "circuenta"* are very doubtful names : they seem to mean this plant). Then there are two yellow Aeizōons : *flavescens*, small and creamy : *lutea*, larger and of a clearer lemon. The red-spotted forms are best represented by *balcana*, medium-sized, and sometimes rather capricious, disliking, I fancy, excess of sun, or perhaps, lime, with flowers very heavily freckled with big crimson spots : and my own *punctatissima*, smaller, but bigger-flowered, peppered with finer grains of red. The rosy forms give us *triternata*, softly pink, but rare and rather miffy : and *S. aeizōon rosea*—perhaps quite the best of medium Saxifrages, if one alone had to be chosen—a very free grower and flowerer, with loose 10-inch sheaves of rich pink blossom, thriving vigorously everywhere (catalogues now sometimes try to give this fancy names such as *atropurpurea*.)

Saxifraga Cotyledon is a great glory ; from a single 8-inch rosette it sends up a waving 2-foot spire of *pure* white flowers, often crimson-freckled. After this it *ought* to die. But there is confusion in gardens. I am told that whenever it doesn't, but goes on making more and more rosettes and more and more tremendous plumes each year, it is not *S. Cotyledon* any more, but *S. altissima* of the Eastern ranges. And yet *S. "Cotyledon"* from the Italian Lakes is certainly as proliferous at times as heart of man could desire. Let us anyhow call the form that mercifully prevails with us *S. altissima*, and be thankful we have got it. *S. pyramidalis* is the same thing : *S. nepalensis* and *S. Montavoniensis* are local forms : the finest

PLATE V

PRIMULA HIRSUTA



of all these is *S. Islandica*, with huge rosettes of strap-shaped iron-coloured leaves, and 4-foot sheaves of blossom. This Icelander, however, is capricious : neither here, nor, I believe, at Kew, will it thrive : lime cannot be a reason, as on oölitic limestone at Oxford it is a splendour. *S. Cotyledon* in nature (as distinct from *S. altissima*) affects non-calcareous rock, but is perfectly indifferent, if not, indeed, positively lime-loving, in the garden.

S. crustata often replaces *S. aeizoon* in the Dolomites : it has darker, more pointed, narrower leaves, with conspicuous silver beading, and *aeizoon's* flowers, but smaller, duller and creamier. Between this and *S. aeizoon* and *S. Cotyledon*, there is an infinite and hopeless series of hybrids, alike in the garden and in nature. These breed indefinitely with each other, and back with their parents, and on to new species, and back with themselves again, till there is no being certain in the garden as to any one of them, except among the established local hybrids that occur in various districts (often given in catalogues as species) : of these are *Sax. Hostii (rhætica)*, *Engleri*, *Churchillii*, *pectinata*, *elatior*, *Gaudinii*, *carniolica*, *carinthiaca*, *australis* (?), *vochinensis*, *Zelebori*, "Zimmereri" (of gardens) and others. With the exception of the last three, which are smaller, these are very robust, spreading, splendid masses of silver leaves, with 15-inch spikes, laxly set with creamy blossoms. They are of priceless furnishing value and foliage value in their many forms, but have not in flower the snowy glory of *S. Cotyledon*. *S. Macnabiana* is a stalwart garden hybrid like a much magnified *aeizoon*, very vigorous. There are many forms though : the genuine *Macnabiana* is a very rare plant, with big white flowers, so densely spotted with crimson at their centre as to give the effect of a solid red eye. My ordinary *Macnabiana*, however, is a magnifi-

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cent, ramping, creamy-flowered plant : that of catalogues, white, with heavy freckling, comes between the two.

Saxifraga florulenta stands quite alone, a tragic and splendid old species, confined to a few cold granite cliffs very high up on the Maritime Alps. Here, in the stark walls, it forms a great solitary disk of incurving, thorny leaves, quite glossy and devoid of silver : throws out, as soon as it can, a solid 12-inch spike of nodding rose-coloured bells : seeds : and dies. This is a very vigorous-natured plant, and likes a good rich soil ; but *insists* on being squeezed into a firm and unsunned crevice, in such a vertical position that no rain ever lingers on its face : also, you must be very careful never to bruise or break its leaves, as this arouses in the plant a mortal resentment. Though *S. florulenta* is violently anti-calcareous in nature, it grows here happily in limestone cliff-crevices, starting in an initial mixture of peat, leaf-mould, sand and fat loam. It detests being waterlogged, no less than being rained on, and has a peculiar tendency to do a good deal of growing in winter. Seed (if you can get it).

S. Kolenatiana is a tall, graceful aeizōon-Saxifrage, with loose sheaves of soft pink. It is a very good grower, and has an even finer, taller form (?) called *major*, or *Sendtneri*.

S. lingulata is, like *S. aeizōon*, a non-existent species, made up of many local varieties. *S. australis* is placed as a variety of this : and there is a very handsome Sicilian *lingulata*, that likes shade : besides another in the Abruzzi, and *S. l. catalaunica* in Spain (*S. catalaunica* of catalogues). This species is always a robust grower, often a shade-lover, and has flowers of purest white. By far the most important is the newly introduced *S. lingulata Bellardii* from the jurassic limestone of the Maritime Alps (*S. lingulata* of Ardoino, and of catalogues). This forms

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enormous masses of long, very narrow iron-grey leaves, silver-edged, and as towzled as a wig, with 15-inch spires, arching or pendent, of the loveliest pure white flowers, occasionally red-spotted, carried in a one-sided spray. With the exception of the next two forms, I could almost call this the very finest of our Saxifrages : it grows sturdily on in any fair rock-work in sun or shade (but enjoying sun), profusely flowers, and can be made to root from each rosette picked off the main mass in August.

S. lingulata lantoscana (*S. lantoscana* of Boissier and of catalogues) is a well-known and well-beloved treasure, confined to the district at St. Martin Lantosque, about fifteen miles West of *S. Bellardii*. It is simply *S. l. Bellardii* reduced by half in all its parts, *but not in its flowers* ; with fatter leaves, too, of a more ochreous grey-green. It has a very marked preference in England, as at home, for the cooler, shadier side of the rocks. There are named forms, such as *superba*, and giant *albida* which almost suggests a mixed parentage, for it also hybridises freely : *S. "Dr. Ramsay"* owes, I believe, half its origin to *lantoscana* ; this is a valuable easy thing, of lovely fat silver rosettes, but with less graceful spikes, and big stolid flowers so heavily freckled with red as to have quite lost the pure elegance of the lingulatas.

S. cochlearis is a true species, but comes so close under *S. l. lantoscana* (whose rocks it occupies in the district of *S. l. Bellardii*) that I must give it place here. It is a priceless garden treasure, for shade or fullest sun, on limestone or sandstone, in any warm soil. It is densely-massed, with innumerable little rosettes of much compressed spoon-shaped leaves, white-blue all over with chalk : and copious in red-stemmed arching 6-inch spikes of pure-white flowers, as gracefully carried as by the others. There is a noble

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huge-flowered major-form, and a tiny compact minor—so minute that nurserymen have for years been sending it out under the usurped name of *S. valdensis*: they now also distribute it under a new but no less unauthorised title, as *S. Probynii*. Division: the rosettes of all these root readily. *S. Burnatii* is a lovely, larger-rosetted, pure white hybrid of *cochlearis* and *aeizoon*.

S. longifolia makes enormous single rosettes a foot across, of narrow bright silver foliage, with a very stiff 18-inch spike of large creamy flowers, in a dense fox-brush pyramid. After this it always dies, and, though it seeds profusely, it so interbreeds with other species that you can never foretell the result. The main beauty of *S. longifolia* is its rosette, which looks superb in any well-drained sunny chink in deep light loam. Pyrenees.

S. mutata is, in its whole habit, like true *S. Cotyledon*, but has rather squinny flowers of a bright orange; it likes a loose, silty, damp soil in a rather shady place. It produces larger-flowered children by interbreeding with *S. aeizoeides* (*S. Regelii*, *S. Haussmannii*), dies after flowering. Lombard Alps. Seed.

THE MOSSY SAXIFRAGES

The finest of the Mossies is *S. Camposii* (*Wallacei* of gardens), making enormous masses of splendid plump green foliage, with profusion on tall stems of big snowy flowers, whether in sun or shade, in almost any soil, reasonable or unreasonable. *S. pedemontana* in its too many forms is much rarer, with even fatter, handsomer foliage, but rather smaller flowers. Another indispensable coverer, though, is that cheap common species called *S. ceratophylla* or *S. pentadactylis* (probably the true *S.*

Schauderi), with many yard-wide masses of fine, crispy-curled horny leaves, and big white flowers. *S. decipiens*, from white to red, is splendid in all its varieties (including *S. caespitosa*) for shadier places : it is the parent of some magnified new forms that I personally think blowzy, coarse and ugly, such as *S. Clibranii*, *S. Arkwrightii*, *S. Miss Willmott*, and various other pompously-named affairs : the specific "*moschata*" (called often *muscoeides*) covers many treasures, from tiny little delightful *atropurpurea*, up to big *Rhei* with its pale pink flowers, and its crimson children Red Admiral, Craven Gem, Guildford Seedling, Stormonth's Seedling, *Fergusonii* and others. Near *Rhei* in general style and value come our white-flowered natives *S. hypnoeides*, *S. Sternbergii*, *S. hirta* (*S. caespitosa*, with a charming miniature *purpurea*, falls under *S. decipiens*), *S. exarata* is creamy yellow : *S. perdurans* and *S. cervicornis* are near *S. ceratophylla* and *pedemontana* : *S. Prostii* and *S. cuneata* are southerners that want a warm, well drained, dryish place in sun : and I should advise the gardener to rest content among these many cheap treasures, instead of bothering his head about *S. Mawiana* from Africa, which is like a moribund *S. Camposii* (the same applies to the very rare *S. arachnoidea* from the Lombard Alps, which loathes damp, is flimsy and poor—and appears to me both hopeless and undesirable).

THE PORPHYRION SAXIFRAGES

The most generally important of the Porphyrian Saxifrages is our own native *S. oppositifolia*, with its Western-Alp form (said to be a true species) *S. Murithiana* : its Pyrenean form, big-flowered *S. pyrenaica* : its splendid six-petalled variety *S. speciosa*, and another fine Italian

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development, *S. latina*. These, to produce their sheets of crimson flowers as profusely as they should, need a fairly poor soil, abundantly watered in spring, and perfectly drained, in a position not too torrid in summer. They also want pulling to pieces and re-planting about every fourth year. Division. There are various colour-forms, and a worthless white one of *S. oppositifolia*. March—April.

S. retusa (from the Graians and Maritimes) is in habit like a very tiny, compressed, glossy, much more bright and charming *oppositifolia*: it grows and creeps more readily in any good cool soil, not waterlogged or parched; and is generous with its upstanding 2-inch heads in April, of fluffy-looking rose-and-crimson blossom. It is a specially attractive jewel. *S. biflora*, however, and its hybrid *S. Kochii*, from the highest moraines, are fat and dullish and difficult: difficult, too, are *Wulfeniana* and *Rudolphiana*, very minute, purplish-flowered high Alpine *oppositifolias* from the Eastern ranges, which can only be made happy in moist, rich, peaty grit, in some cool chink or corner untroubled by sunburn. Division.

Of the London Prides, attention need only go to dear little *S. cuneifolia*, which is like a very delicate dainty miniature of *S. Geum*, with airy 4-inch showers of bloom. It grows and runs delightfully in any shady corner in good loam. Larger and solider, but no less lovely, is *S. primuloides*, which, in the same or less select circumstances, makes humped masses of brilliant rosettes, with 6-inch showers of the most charming rose-pink blooms. Division.

And here, to finish with the useful oddments of the race, I will quote *S. Fortunei*, with broad, glossy leaves, and foot-high corymbs of big, white flowers in November.

This, though hardy, likes a sheltered nook in rich soil (China). *S. aspera* and *S. asp. bryoeides*, are high-moraine plants, but of the easiest culture anywhere. They are like rambling sheets of moss, with large whitish or cream-yellow flowers carried aloft on fine 5-inch stems : *S. Cymbalaria* is a golden-flowered little annual which may be trusted to go on sowing itself all over any cool shady bed : *S. aeizoeides*, *S. Hirculus major* (often sold as *S. diversifolia*) and the very rare true *diversifolia* are excellent for cool, boggy, peaty levels at the base of the rocks. These are golden-flowered, and about 6 inches high. *Hirculus major* is by far the finest and most brilliant : our native *aeizoeides* has lesser, but still effective yellow stars ; *S. diversifolia* seems to me rank and small-flowered in proportion to its size. Division.

THE ENGLERIAS

The Saxifrages of this group bear a close strong generic likeness to each other. Tiny flowers and big conspicuous calyces are their mark. Western Europe only gives us *S. media* or *calyciflora* from the Pyrenees, with a fat silver rosette like an Aeizōon, and a loose 6-inch spike in May of purple bells. This endures a cooler chink than the rest, which are almost all from the Balkans, and firm sun lovers, blooming much earlier. Next comes *S. porophylla* from S. Italy, with cushions of narrow leaves and spikes of rose-and-yellow flowers : *thessalica* and *Bertolonii* are of the same nature, rare and interesting things : *Frederici Augusti* is more obscure ; of the two forms that bear the name (catalogues also offer, under it, an Aeizōon) one is very close to *S. thessalica*, and the other to *S. Stribnryi*. This last is rather like a bigger Balkan version of *S. media*,

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of easy culture and sound habit, blooming about the same time, with beautiful round-leaved rosettes, and large pendent claret-coloured bells and bracts, distinctly arranged in a loose spike—instead of being spiny-leaved, with a dense compressed crimson spike, like *thessalica*, *Grisebachii* and *Bertolonii*. *S. luteo-viridis* from Transylvania is not unlike it in habit, but has pale calyces, yellow flowers, and a general look of a Cowslip gone mad. *S. corymbosa* seems a mere variety of this. Last of all comes the best known, *S. Grisebachii*, with the beautiful rosette of *Stribnryi*, and the dense crimson spike of *S. thessalica*, in March and April. These plants will thrive in any warm place, not too parched, in a light limy loam; they are attractive and curious, rather than regally brilliant. Their leaves, however, whether rounded or spinous, are always of the most entrancing silver sheen. Seed. They interbreed freely, *Gusmusii* (*luteo-rosea*) and *Schottii* are both hybrids, and there is an immense, indefinite series of named beauties, of which *S. Lapeyrouseii* is the best, between *S. media* and *S. aretioeides*: *S. Godroniana*, *aurantiaca*, *racemiflora*, *luteo-purpurea*, and *ambigua*. The last two names often appear in catalogues: when they do, you can have no foresight as to what they will mean, except that you may be quite sure they won't mean what they ought. *S. Kotschy*i is another plant of this section, always appearing in lists, and always falsely. The real *S. Kotschy*i is a very rare Engleria, hardly known in cultivation, any more than the precious *S. Stuartii*, which is a yellow-flowered twin to *S. calyciflora*.

THE KABSCHIA SAXIFRAGES

This section leads off with some invaluable furnishing species and hybrids of very free growth in any open

place, and in any good, well-drained loam. *S. apiculata* (with a new form, *alba*), *S. juniperina*, *S. sancta*, *sancta speciosa*—or *L. C. Godseff* (with *S. Burseriana* blood in it, a rare beauty) and charming *S. Elizabethæ* are quite gardeners' commonplaces by now. They thrive and spread prodigiously, and can be divided as easily as a family. Huge turfs of shiny emerald fur they make, with 6-inch spikes in varying shades of yellow through March and April. *Apiculata* is softly primrose : *Elizabethæ* (*Burseriana* × *sancta*) is smaller than the rest, with bigger, clear citron flowers gathered loosely at the top of 3-inch stems. There is also a hybrid "*Bursiculata*" (*Burseriana* × *apiculata*), which grows well, and is like a white *apiculata*.

Rather more choice and less rampageous, but no less easy in any warm, well-drained limy loam, are all the species that cluster round *S. Rochelliana* and hail from South Italy and the Levant. They form tumbled wide mats of shoots, whose rounded silver-hemmed leaves are so closely compressed as to make, ultimately, what looks like a typical Aeizōon-rosette, small and neat. They bloom in March and April with very big and brilliant flowers, white or yellow, clustered loosely at the top of a 4-inch stem. The most dazzling is a variety of *Rochelliana* called *coriophylla*, then come *S. marginata* and *S. Boryi*, said to be synonymous, and rare (S. Italy, and Greece) : the very precious *S. Joeggeana* : the sham *Kotschy*i of catalogues, with ragged yellow stars : a new yellow form of *Rochelliana* : many pretty little things called *S. scardica* : and the genuine *S. scardica* itself, a rare treasure, with mats of thorny silver leaves, and the tallest stems of this group, attaining five or six inches, with a clustered head of big white flowers at the top. Careful division. (*S. scardica* is very easy, but often dies off brown in patches.)

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There is still much confusion in this group, hanging like a cloud round *S. Rochelliana*. Intermediate between these and the smaller Kabschias come several very desirable easy little beauties—among others, *S. Oberstii* (*Burseriana* × *marginata*), *S. dalmatica*, *S. macedonica* and *S. Eodoxiana*—with cushions of lovely green or silver, and very splendid big white flowers on 3-inch stems (yellow in *S. macedonica* and *S. Eodoxiana*).

Saxifraga Vandellii is perhaps our nearest Western counterpart to *S. scardica*. This blooms in May and June, and forms huge prickly domes in the hardest, hottest, and sheerest limestone precipices far above the Italian Lakes, from which it hangs out its crowded heads of white blossom on 4-inch stems. This species is much too rare in culture ; it loves sun, and a tight place in a well-drained, rather droughty limestone crevice. Very different indeed are the requirements of its Eastern twin, famous *S. Burseriana*. This detests sunshine and open positions : it grows chiefly in the Southern Dolomites, at low elevations, in very deep ghylls and ravines, where it makes big masses on the un-sunned cliffs, or springs in profuse cushions from the humid white limestone silt at their base. It is a perfectly easy plant to grow, however, in any cool chink or corner or moraine, not too hot or dry. It has many forms : *S. B. major* of spreading habit, large, but ungenerous of flower ; *S. B. minor*, very compressed, with red stems and big blossoms ; *S. B. crenata*, with petals slug-nibbled round their edge. *S. B. tridentina* is the general name for the specially fine form that haunts the Alps of Trient : from this has emerged *S. B. Gloria*, extraordinarily vigorous and free, with 4-inch green stems and enormous snowy flowers. This is the only *Burseriana* that sometimes carries two blossoms on a stem. But even more splendid still is my

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as yet unpublished *S. B. magna*, quite as vigorous and free, but with a much compacter habit, producing profusion of flowers even bigger and rounder than those of *Gloria*, on 2-inch stems of glowing ruby-red. Careful division and cuttings in late summer. *S. Burseriana* is the first of the section to flower—in February and March.

S. Burseriana is responsible, too, for some very precious hybrids, especially with *S. aretioeides*. These have cushions of silver spines, and large, usually lemon-yellow, flowers. Of these by far the best are the new and splendid citron beauty *S. Paulinæ* (*Burseriana* × *Ferdinandi Coburgi*) and the snowy *S. Petraschii*—very free, very floriferous, very easy in any open place (for these mules will take a much more exposed position than *S. Burseriana* usually affects), for unfortunately some of the others, notably the expensive *S. Boydii*, are of poor constitution and uncertain temper : so is lovely *Faldonside*, with its huge lemon-pale blossoms : *Cherry-trees* makes fine deep-green masses, but never flowers : *S. kestoniensis*, though, (*Burseriana* × sham *scardica* ?) is a very beautiful and very early white-flowered hybrid of sound good humour. As for the white so-called "*Boydii*" it is as free and easy as the yellow is difficult : but I cannot allow it to be the same thing at all : its leaves are fatter, its habit straggling, its aspect always coarse and moth-eaten and untidy. *S. Salomonii* (*Burseriana* × *Rochelliana*) is much more compact and quite as robust, with finer leaves, and the same brilliant white flowers, two or three to a short red stem. Very careful division for these, at the end of summer. They blossom freely between February and April.

S. aretioeides, responsible for so many hybrids with *calyciflora*, is a minute Pyrenean, like a wide grey scab of lichen, with 2-inch stems of yellow flowers rather thin

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and pale and greenish in colour. It is not difficult, but capricious ; I have never had much pleasure from it, have never collected it, and can only prescribe a cool, well-drained place, either in sun or shade, but not too torrid. The bright yellow form, which is very rare in nurseries under the name of *S. aretioeides primulina*, belongs in reality to *S. diapensioeides*, though I do not know its history or birthplace.

S. diapensioeides, from shady cliff-chinks on limestone, in the Pennine, Graian, Cottian and Maritime Alps, is one of the loveliest of Kabschias. It has just the minute grey hardness of the last, with 2-inch spikes carrying three or four very large flowers of purest white in April and May. This exquisite little plant seems to dislike moraine here, but is of the happiest temper in any cool, well-drained chink, in rich vegetable soil, on the shady side of the rock-work. The same in habit, but even more miniature in its packed grey-green masses, dull and spiny, is the still rarer *S. tombeanensis*, with white flowers nearly half as big again. This is confined to a few hot limestone cliffs in the Lombard Alps, and grows with perfect vigour and speed in any good limy loam, on the sunny side of rock-work. It is a remarkably beautiful little plant, and stands as a connecting link between *S. diapensioeides* and *S. Vandellii*. Not unlike this in habits and needs are the very rare yellow-flowered Eastern novelties (though with much smaller blossoms) *S. Haagii*, *S. pungens* and *S. Desoulavyi*; *S. Ferdinandi-Coburgi* from the Balkans is, in grey charm of foliage, a twin to *diapensioeides*, but loves sun as much as *tombeanensis*, and has 3-inch stems, with heads of not very large flowers, rather earlier, of a shrill yellow ; it grows and spreads quite easily into a good tuft in any open limy loam. It has given two splendid hybrids, too,

either way round, with *S. marginata*, in *S. Borisii* and *S. Kyrillii*, harking back in habit towards *S. marginata*, but with lovely heads of big yellow flowers, starry and paler in *S. Borisii*, but very beautiful in both. They are free thrivers, easy and hearty, and take their names from the Bulgarian Princes, Cyril and Boris.

Saxifraga caesia is the commonest of Kabschias in the high Alpine ranges on limestone, forming very neat cushions of tiny blue and white rosettes, above which, in June, hover the large white flowers, two or three to the dainty threadlike stem. It is a thing of exquisite charm, but not quite so certain in culture as its universality would lead one to expect. It always thrives in the moraine, but does not like being parched, and appreciates a very well-drained and cool corner of the rock-work, where it can have as much sun as it approves, and no more.

In nature it has yielded some choice hybrids—all very rare, all needing attention, and all appreciating moraine or a good chink. With *S. aeizoeides* it has produced *S. patens*, a butter-coloured version of itself; with *mutata* the even rarer yellow *Forsteri* (*S. Forsteri* of catalogues is an Aeizöon), and with *S. squarrosa*, *S. tyrolensis*, exactly between the two.

For *S. squarrosa* shares the Dolomites undistinguishably with *S. caesia*. *S. squarrosa* is much more minute in habit, pointed leaved, not so silvery, looking like nothing so much as a sheet of close green-grey lichen, with large white flowers in June on airy stems. It is much more universally easy and trustworthy than *S. caesia*, in any cool corner, chink or moraine, and is a jewel of the first water. Careful divisions to be struck in August.

Saxifraga laevis (*S. laevis* of catalogues is an inferior Mossy) is an Asiatic novelty, with glossy shoots, at first

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sight more like a Porphyrion's, and heads of clustered bright yellow little flowers, spidery with their anthers, on flopping 3-inch sprays. It is not quite so beautiful as it is rare and interesting ; it appreciates moraine, and seems of reasonably easy temper. Another Himalyan beauty is *S. lilacina*, startlingly beautiful ; it forms a quite flat silvery-rosy scab, with very big lavender-lilac flowers, carried singly on stems of an inch and a half. I cannot speak quite certainly of its culture ; it seems to be perfectly willing, and is well suited in fine, not too torrid moraine, but even better in gritty chippy soil in a cool choice corner. It does a good deal of growing in autumn and winter, and therefore may be divided late in the season.

S. valdensis is a true species, and a Kabschia. It haunts micaceous cliffs in full sun, and has only a very few stations, in the Cottian Alps, high up (most of the Kabschias are not *high Alpines*). It forms firm humped domes of blue and silver rosettes, the narrow leaves rolled down tight on the mass : the graceful flower-stems are about 4 inches high (in June), glandular, rose-red, carrying up to half a dozen very large pure white flowers. It is almost unprocurable in cultivation, for, though its name appears in all lists, the plant they invariably mean is *S. cochlearis minor*, which has indeed a rough working resemblance to it, but no sort of real connection. *S. valdensis*, however, thrives freely in any good chink, in any good soil, limy or sandy, whether in sun or shade, but always perfectly drained. Indeed, for a natural lover of sun and sandstone, it rejoices astonishingly in tight sunless crevices of my limestone Cliff. Very careful cuttings, if you dare to meddle with its propagation yet awhile.

PLATE VI

GENTIANA Verna AND ANDROSACE LACTEA



CHAPTER VIII

A MIXED LOT

AMONG the many big St. John's Worts are several minute things that deserve specially to be called into the rock-garden, especially as they bloom in late summer. *Hypericum repens* has narrow leaves, a prostrate habit, and golden flowers : *H. humifusum* pours itself along the ground : *H. polphyllum* makes a neat, frail bushling of 6 inches, as does *H. lydium* : *H. fragile* has a flopping habit and big flowers ; it is highly praised, but to me can never equal *H. reptans* and *H. Coris*, not only the glittering jewels of their race, but two of the brightest gems in the whole garden. *H. reptans* falls in a prostrate sheet of foliage, thick with huge flowers of pale gold with a rosy reverse, in autumn. *H. Coris* has wiry, fine-grey foliage, and weakly aspiring delicate stems of about 6 inches, spraying abroad a loose shower of rich, golden flowers. It is found in the Maritime Alps, even in roadside gutters. These two exquisite beauties are of the easiest culture in any good light soil. *H. reptans* also appreciates shade, and does not always approve of *too* violently cold a position in winter. Seed and cuttings. As for our Rock Roses, forms usually of *Helianthemum vulgare*, they stand high among the most valuable of all rock-garden plants. They grow *everywhere*, as long as they are in full sun, make enormous humped masses (cut them back in earliest spring to keep them shaped to your taste), are immortal, nearly evergreen, and nearly as beautiful out of flower (if ever they *are* out of flower) as when they are snowed under with a drift of great blossoms, snowy, tawny.

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golden, salmon, scarlet, crimson. There are double forms, Balgreen, Jubilee, &c., which are quite endurable, but of course not nearly so brilliant as the single types.

Among the Potentillas, innumerable are the hideous weeds, either gawky or minute. *P. Tongui*, *P. ambigua*, and *P. nepalensis* "Miss Willmott" are neat and small, though: the first with salmony flowers, the second golden, the third rosy. All (as indeed, *all* Rosaceæ) freely thrive in any light and open soil. The first two, in addition, ramp about, and spread and form mats. No less valuable is our native Alpine *P. verna*, with its mountain cousins *P. aurea*, *P. alpestris*, *P. pyrenaica*, forming taller or dwarfer masses of rich yellow: *P. rupestris* is a very rare native, tall and white, for a rocky chink: smaller and choicer is *P. caulescens* from the Southern Alps, always in cliff-chinks: and yet another white saxatile Potentilla is tiny and very rare *P. Saxifraga*, whose wide cushions support *Primula Allionii* in its limestone precipices.

The gems of all gems, though, are *P. nitida* and *P. Clusiana*: these form perfectly flat and yard-wide cushions of silver foliage, starred with countless little dog-roses sitting tight on the mass: those of *nitida* are richly pink (white in one form), those of *Clusiana* pearly-white. *P. nitida* fills the high cliffs and shingles of the Dolomites: *P. Clusiana* is far rarer, and very rare in cultivation, from the Eastern limestones. Both species are perfectly easy in any good soil, but insist on full sun, appreciate lime, and are occasionally torpid about flowering if their diet be too rich. The remedy, if one becomes necessary, is to plant them in moraine, or squeeze them between rocks. Cuttings or division, in April.

Closely akin to Potentilla is *Waldsteinia geoides*, an invaluable little trailer, which runs all over the place any-

where, and throws up on airy 5-inch stems a profusion of bright golden flowers in spring and summer. Division at any moment. It is almost a Geum. Of Geums *G. montanum* is an old friend, creeping into a wide mat, with very large soft gold blossoms carried singly on short 4-inch stems. This is a universal Alpine (*G. rhæticum* is a local form), and of the happiest temper anywhere and the easiest culture, though much less rapid and invasive than *Waldsteinia*. Division or seed.

Geum reptans is a bigger, more noble affair altogether, from very high up in the coarsest and barrenest of granite debris-slopes, where it roots woodily a yard and more into the chaos, sends out runners like a strawberry, and above its masses of fine soft foliage throws up on 6-inch stems, enormous golden cartwheels that pass, in time, to a whirl of twisted rosy-silvery fluff. In cultivation this glorious thing seems to dislike moraine, and asks for richer food. In open, very deep and very sandy loam it thrives robustly, and no less robustly blooms through the summer. Seed, and separation of the runners as they root at the tip.

Finally, the Roses give us some precious rock-sheeting shrubs in the prostrate Cotoneasters, *C. adpressa*, *C. pyrenaica*, *C. glacialis*, *C. humifusa*, *C. congesta*: and another, precious beyond any price, that easy, universal and remarkable Alpine, *Dryas octopetala*—a flat carpet of evergreen little oak-leaves, three yards and more across, from which, on 3-inch stems, starts a profusion of immense white flowers like glorified Anemones. Cuttings in spring: or seed. There is a tiny minor form, a native Alpine: and a silvery downy one, *D. lanata* or *vestita*: a frailester one, *D. tenella*: and another species, *D. Drummondii*, from the Rockies, similar to *octopetala* in leaf and habit, but with yellow flowers that are quite valueless because

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they never open properly, and also droop their heads in dowdy though decent shame.

The Flaxes give us big, easy things of perennial value, in golden *Linum flavum*, rosy *hirsutum*, and purplish *L. viscosum*; *L. alpinum* is a delicate frail flopping plant of the Alpine turf in the Graian and Maritime ranges, with abundance of pale blue stars: and of even richer charm is *L. austriacum*, which replaces it on the Lombard limestones, and has a more erect habit, with flowers of a clear and brilliant blue. There is also a counterpart to this, with rosy flowers, the rare new *L. tenuifolium*. And *L. salsoloides*, from the Mediterranean coast, is similar in habit, but very spidery with enormous pearl-white flowers. Seed. These Linums are quite easy and hardy, but the last four demand a hot corner in fullest sun, in a light warm soil sharply drained.

This rule applies also to another race of Southerners, the lime-loving Erodiums of the Levant, cousins of the Geraniums. Omit coarse *E. Manescavi*: all the rest are masses of ferny silver leafage, and 10-inch gracious stems of lovely little Geraniums, in shades of pink, freaked with dark lines and blotches. *E. chrysanthum* is very rare and lovely, with sulphur-yellow blooms above silver-white fronds: *E. Macradenium* is not silvery, but has a wonderful fantastic small Pansy-face: others, of rich value and vigour, are *E. guttatum*, *E. roseum*, *E. Guicciardii*, *E. supracanum*, *E. Sibthorpii*, *E. cheilanthifolium*, *E. Willkommianum*, *E. olympicum*. Seed, if possible. *E. chamaedryoides* (*E. Reichardii*) is a complete break in the family—a minutely tiny thing, not an inch high, with an incalculable number of white flowers. This likes, and deserves, a choice warm corner, but it is quite easy and hardy. Majorca.

Big Geraniums lie outside my present scope. But

with not one of the small ones can the rock-garden dispense. *G. Wallichianum* (be sure and get only Buxton's var.) is a prostrate Himalayan, with immense blue-purple flowers: *G. lancastriense*, a prostrate *G. sanguineum* with exquisite pink flowers, veined with crimson. The glories of the race, though, are *G. argenteum* and *G. cinereum*. These are robustly vigorous in any sunny place and clean soil. No words can adequately paint the beauty of *G. argenteum* as it makes the whole enormous grassy ridge of Monte Baldo one dense sheet of its frosted silver leaves, spattered all over with huge flowers of soft pale pink. In gardens it grows stouter, and attains 6 inches or so, and is invaluable. Exactly similar, but unsilvered, rather duller-flowered, and not quite so fine-leaved, is *G. cinereum* from the Pyrenees. The albino form of this, though, is one of the most beautiful things imaginable. It is still, however, so rare as to be almost un procurable. Seed, or cuttings, in April, of the woody shoots from the main trunk.

Nothing shall lure me into a critical list of *Sedum* and *Sempervivum*. The smaller *Sedums*, *album*, *anglicum*, *acre*, *oregonum*, *Ewersii*, and so on, are invaluable but often pestilent weeds to cover dry worthless places: larger trailers, such as *spurium*, *kamschaticum*, *rupestre*, and *reflexum* profitably occupy larger, but no choicer spaces: upstanding ones, like *populifolium*, *rhodanthum*, *Rhodiola*, and *spectabile* are stalwart, and the last has enormous heads of chalky-pink in autumn. Really choice members of the family are little *S. brevifolium*, *S. dasypodium* and *S. corsicum*: the dainty and not very robust *S. pulchellum*, like a small pink *rupestre*: our tiny rosy bog native *S. villosum* for damp places: and *S. pilosum*, which is so charming that it must certainly be called *Sempervivum*,

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not Sedum. It has hairy Sempervivum-rosettes and big heads of very big pink Bouvardia-like blossoms on fat 4-inch stems; it craves a warm, well-drained place, and dies after flowering (as also does its twin in need and habit, the rare scarlet-flowered *Sedum Sempervivum*).

As for the Houseleeks, these indeed are quite priceless for the rock-garden, but so minutely differentiated that here I have no room to be subtle with the desperationing multitude of their names. Plank 'em all down in a wall-chink, or on a bare ledge of rock, in as much depth of soil as you can manage, *and in fullest sun*, but *don't* give them a mixture of clay and dung, as Clark's book advises, or they will all die (mine did, at least). Among the best big ones are, *Sempervivum triste*, *Comollii*, *Reginae-Amaliae*, *Tectorum*, *Funkii*, *Wulfenianum*, *rubicundum*, *Gaudinii*: of medium and small ones, *montanum*, *Greenii*, *Pittonii*, *fimbriatum*, *Boutignianum*, *pyrenaicum*, the rare and tiny *Laggeri*, and the indispensable, universal little cob-webbed *arachnoideum*, with its form *transalpinum* which is so woolly as to look like a mat of white balls.

Very different treatment, in loose, cool woodland soil, gives you your only chance of pleasing *Linnaea borealis*, with its twin little pink Gloxinias, hanging daintily from 3-inch stems, above its trailing sprays. Much less capricious, however, in such a soil and site, is its even lovelier, slightly glorified twin, *L. canadensis* from the Rockies. The Ramondias again, planted in peaty leaf-mould in some shady vertical chink, are all of the robustest, happiest nature. *R. pyrenaica*, *R. serbica*, and *R. permixta* are each good, but by far the best beauty is *R. Nataliae*, freer of brighter, bigger, blue-purple flowers, from a tidier, glossier rosette—and in every way a more brilliant plant altogether. Similar in need and habit is lovely *Haberlea rhodopensis*,

with heads of purple (or white) Gloxinias : but silver-leaved *H. Heldreichi* (or *Jankaea*) is very difficult, and *must* have an absolutely rainproof cavity in sandy, leaf-moulded peat.

CHAPTER IX

THE CAMPANULAS

No race is of greater value in the garden, and especially in the rock-garden, where July, August and September are too often a verdant void. For the flowering season of Campanula covers precisely those three months of barrenness. Most of the race, too, are of the easiest culture, and almost all are of delightful beauty, rare ones and common alike. The general rule for the cultivation of the smaller rock-garden Campanulas (I am not going to touch the larger species here) is, *full exposure and a light, well-drained soil*. With a very few exceptions saxatile Campanulas are eager lovers of lime and sun. And with no exception, slugs and evil things (as well as good gardeners) are lovers of Campanula.

The race finds the centre of its distribution in the Eastern side of the Mediterranean Basin, up to the Caucasus. Most Campanulas are usually of the easiest propagation, rooting easily from offsets at any time between March and December, but preferably, I think, in April and September, yet coming readily from seed in the case of such rosetted species as *barbata* and *alpina*.

C. abietina forms a wide mat of green, with many wide purple stars on tall fine stems. It is a very easy doer, but requires to be pulled to pieces every other year, to keep it going.

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C. Allionii.—Very beautiful, quite dwarf, with narrow silky-grey leaves and large violet bells. Stony banks and cliffs in Dauphiné, Savoy, Maritime Alps. A difficult species, which however is quite safe to grow robustly in non-calcareous moraine, or the clefts of a wall. It is a strong lime-hater. Division (with care).

C. alpina.—Singularly beautiful, and far too little known. Like a miniature *barbata*, growing about 6 inches, with a spike whose individual flower-pedicels are so long that the effect is that of a very loose fountain of immense clear blue bells, fluffy and fringed. The plant forms a tap-root and a basal rosette : it is best raised from seed. It thrives easily in any light, limy loam in an open place. A rare but locally abundant species from high grassy Alps in the limestone ranges of Styria, where it replaces *C. barbata*, and is always soundly perennial.

C. Aucheri.—A rare and beautiful novelty of easy culture. Medium-sized, like a larger *C. tridentata*.

C. barbata.—A much magnified, pale and coarsened *C. alpina*, about a foot high, exceedingly lovely and well known. Propagate from seed, and be careful to grow it in a very well drained stony soil to be sure it does not die after flowering. Very common on grassy Alps in the Western ranges.

C. Beauverdiana.—A Caucasian novelty as yet very rare, of medium habit with loose showers of wide violet stars.

C. caespitosa is invariably catalogued as *C. pusilla* (there is no separate species *C. pusilla*). It is the universal little Fairy bell of the Alpine shingles. For any rock-work it is quite indispensable ; too vigorous and spreading for the choice moraine. Its white form is one of the oldest plants in English borders and cottage gardens. There are also other fine developments, large, deep or pale—one is called

C. tyrolensis; and there is a charming late-flowered form or hybrid called "Profusion." Division.

C. carpatica.—An invaluable, cheap Campanula. Perpetually profuse of blossom and vigorous of growth on every rock-work or border. Not to be associated with treasures. There are many named forms, such as Isabel, White Star, Riverslea, and others. Also hybrids with *C. pyramidalis* and other species such as *C. Hendersonii* and *C. Fergusonii*, medium-sized fountains of splendour, but rather miffy and short-lived—especially the poorer, *C. Hendersonii*.

C. cenisia.—One of the most exquisite of moraine plants, but will grow nowhere else. Perfectly dwarf, with sheets of stemless clear blue stars. From the highest stone-shingles only, local and rare. Division.

C. collina.—Of medium size and easy culture. Loose spikes of huge violet-coloured bells. From the Caucasus. A beardless, purple slenderer *barbata*, but ramifying at the root instead of forming a single rosette, and a plant of rare glory.

C. Elatines, a very saxatile and precious plant, restricted to rock faces in the Cottian Alps. It is most beautiful, with prostrate branches thick set with open big violet stars, after the style of *C. gorganica*. It must have a tight crevice in perfectly hard rock, whether in sun or shade, and particularly resents being rained on to excess. In nature it is granitic in its tastes, but seems indifferent in the garden. Seed. (These remarks apply also to *C. elatinoeides* from the Italian Alps.)

C. excisa.—This lovely treasure I find the hardest to grow. It is like a little purple *caespitosa*, with perforated bells, and is restricted to the shingles round the mass of Monte Rosa. It is passionately anticalcareous : the best hope is to have it in a fine, dampish moraine in a cool situation, or in the moss covering a large cliff or boulder. It has a way of

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dying off in one place and coming up in another. With me it dies off everywhere and never comes up anywhere else. Division.

C. G. F. Wilson.—A hybrid of *C. pulla* × *turbinata*. A very valuable, easy and robust little plant, spreading freely, and copious with its shallow violet-coloured bells on massed 6-inch stems. Division.

C. garganica.—The type of Mediterranean Campanulas. With pendent branches and abundance of wide blue, starry flowers, quite flat. In type this plant (like *Mayi*, *isophylla*, and others), dislikes damp, and prefers a sunny sheltered chink in hard rock. But besides the varieties *major*, *hirsuta* and *Murettii*, it has a form, *garganica compacta*, which is perfectly glabrous and glossy, very compact and free, and altogether one of the *finest small jewels of the whole race* for the rock-garden. This form appears in catalogues under the false name of *C. Erinus*. It is absolutely hardy and indifferent to damp. Cuttings. Even *C. isophylla* with a pane of glass over it in winter is quite hardy in the coldest parts of Northumberland, with magnificent curtains, from any crevice, of huge starry flowers of clear blue.

C. glomerata acaulis has dwarf huddled heads of violet, and grows anywhere.

C. haylodgensis.—A lovely little hybrid (*carpathica* × *caespitosa*) with yellowish glossy leaves and abundance of wide, clear blue bells which are specially valuable for appearing freely far on into October. A very easy grower in sun or shade. Division. There is a double form.

C. Hostii.—A stocky form, or hybrid, of *C. rotundifolia*. Very easy, large-flowered and beautiful : usually grown in its albino form. Seed.

C. lanata is an immense peach-and-cream candelabrum from Rhodope, demanding sun and detesting damp. Seed.

A magnificent great rarity for rich warm places or districts.

C. linifolia.—This, with *C. lapponica*, *alaskana*, *valdensis*, *Scheuchzeri*, *carnica* and others, may well be considered as varieties or sub-species of the Harebell. *C. valdensis* is the loveliest, with a silky grey down and big violet bells. *C. Scheuchzeri*, from wet places in the Swiss Alps, has huge violet bells, but soon goes back to pure *rotundifolia* in cultivation. All these are perfectly easy. There are lovely white and pallid forms of *C. linifolia* and *Scheuchzeri* at least, most probably of the rest. Seed.

C. longistyla is gloriously beautiful, but a biennial. Not unlike *C. collina*, but even bigger in flower.

C. macrorhiza.—A rare and invaluable treasure from rock crevices of the Maritime Alps. Like a bushy, very free-flowering Harebell, with smaller, more numerous flowers, of a richer lilac-mauve. Flowers abundantly, both early and late, and is quite easy and vigorous in sun or shade. Cuttings and seed.

C. mirabilis.—A most ancient Campanula from the Caucasus. Suggestive of a glossy beardless *barbata*. Dies after flowering, though, and seems to prefer a poorish soil. Seed.

C. Morettiana is a very precious, tiny, difficult and rare plant from hard limestone crevices of the Fassa Dolomites. A cool, shady, firm chink best meets its needs. It is so small that it needs special care, and its glorious purple bells amply repay you. Cuttings.

C. muralis.—This, with its major form (called also *bavarica* and *Portenschlagiana*), is the most useful of all-round rock Campanulas. Evergreen, brilliant and almost perpetual flowering, with abundance of large wide violet bells, very easy and indestructibly robust. Cuttings. From Easterly ranges.

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C. petraea.—Very rare and very ugly. Peculiar to the Maritime Alps. Dull yellow.

C. planiflora (*nitida*).—Like a prim little dwarfed *C. persicifolia*, with stocky 6-inch spikes of big, flat flowers. Quite easy.

C. pulla.—A well-known jewel from Eastern Alps. Nodding bells of deep pure violet on 4-inch stems. Very easy, but likes a cool vegetable soil (among limestone blocks in nature). Should certainly be tried in moraine. Division.

C. pulloides.—A form or hybrid twice the size of *C. pulla*, and most gorgeously beautiful. Thrives anywhere in reason and looks splendid in the moraine. Division.

C. Raddeana.—A beautiful medium sized Caucasian, with loose spires of rich violet harebells, and lovely long-stalked crenate foliage. Division. Easy.

C. Rainieri.—This is a purely saxatile species from the limestone Alps of Como : it is a most precious treasure, but beloved by slugs. It thrives very happily in the rock-garden and appreciates a sunny chink or moraine. Quite dwarf, greyish broad foliage, and immense blue cups. Division.

C. rupestris is very beautiful, difficult, fluffy and saxatile, for a warm dry chink. An extremely rare Campanula from the Levant.

C. rhomboidalis.—A splendid robust meadow- and border-plant, with a pale form. It spreads freely, and grows about 2 feet in cool, rich soil.

C. sarmatica.—Like a magnified, more vigorous, more profuse, more certainly perennial, and less exquisite *barbata*, beardless and bushy in habit. A splendid introduction from the Easterly ranges. Seed.

C. speciosa.—A Pyrenean, forming a vast rosette in any open sunny soil, from which in due time springs a spike

of Canterbury Bells. It dies after flowering, but comes well from seed.

C. Stansfieldii.—A charming little hybrid. Very rare very dainty, and very easy. A choice treasure of unknown origin, suggesting a wild hybrid, *C. Tommasiniana* × *carpatica*, with open hanging bells.

C. stenocodon.—Not yet proved in culture, but rare and beautiful, like a frail Harebell, as it grows on moraines and high shingles of the Maritime Alps, with long narrow trumpets of deep blue.

C. Tommasiniana forms an exquisite little bushling of frail 5-inch stems, set with nodding narrow tubes of blue. Good-tempered, but very choice, for a cool corner.

C. tridentata (to include *C. Saxifraga*) is a valuable, easy Levantine plant, quite dwarf, with very large violet bells. Rather like a bigger, tufted *C. Allionii*. It thrives readily, and likes a sunny moraine. Seed.

C. turbinata.—This, if genuine (which it too seldom is), suggests a very dwarf, neat *C. carpatica*, with the same immense flowers on stems only 3 inches high. It is of the most vigorous growth, and quite invaluable. There are white and pale forms (as, indeed, of all blue Campanulas). Division.

C. Waldsteiniana from Dalmatia is like *C. Tommasiniana* in habit, but with erect, open, wide stars of blossom. It is quite as good-tempered and quite as choice. Cuttings.

C. Zoisii comes from Styrian and Idrian stone-slopes. It is a minute and most exquisite plant, with profusion of pale-blue bulging tubes, curiously puckered and sealed at the mouth. It is of surprisingly easy culture, in good soil or moraine, in a cool select corner, but a slug will often annihilate it in one night. Division.

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Edraianthus dalmaticus*, *E. caudatus*, *E. caricinus*, *E. tenuifolius*, *E. graminifolius*, *E. Kitaibelii* and *E. dinaricus, form rosettes of coarse, grassy-looking foliage, with clustered heads of violet bells, at the end of almost decumbent 6-inch stalks. They are all from Eastern Europe. *E. pumiliorum* and *Pumilio* form much finer tufts of silver-grey foliage, with big pale violet bells, stemless, and produced singly in great numbers on the frosted cushion. *Pumilio* is the smaller, daintier and choicer: one of the most cherished of Alpines, and a thrifty doer in any good place, in fine soil rubbly with lime. It is, above all, a glory of the moraine.

Wahlenbergia saxicola is a New Zealander, which runs about freely in light warm ground, throwing up on fine stems, charming flowers, white and veined, well above the ground-hugging mat of its foliage. It is very new and rare, so that its hardiness is not universally proved, but it divides so readily that an offset can always be taken off in autumn for safety.

***W. serpyllifolia* (*Edraianthus serpyllifolius*)** is a glorious and indispensable treasure for the rock-garden. The type, however, need no longer be thought of, as the major-form has blossoms of twice the richness and size. Makes a tight humped mass of thyme-like foliage, from which hang down in due time of year, over the rim of the rock, countless enormous cups of the richest imperial violet, carried singly each at the end of a 4-inch stem. Very easy and kindly of habit, only asking for light calcareous soil in an open place.

Phyteuma comosum is the easiest Alpine of its large family. Paradoxically so, for it haunts the tightest chinks in the hardest Dolomitic or limestone cliffs, always by choice on the shadier exposures. Yet it thrives happily

PLATE VII

SAXIFRAGA GLORIA (*white*) AND S. OPPOSITIFOLIA



in well-drained, deep limy loam almost anywhere on the rock-work—a weird beautiful thing, with dark leathern-looking leaves, and clustered heads of big dim-blue soda-water bottle-like flowers on 3-inch stems. Slugs, however, worship it, and pursue it from afar.

CHAPTER X

THE PRIMULAS

THIS imperial race has, at all events in its Alpine section, a bad name for difficulty. This is really undeserved : the requirements of even the most saxatile species are only perfect drainage, a firm crevice, and an open position. They are quite indifferent here, as to whether their exposure be cool or hot, but, as a clan, they detest a parching atmosphere. The family is divided up into numerous very well-marked sections, so that it will not be necessary to do more than talk of the one or two most representative species in each group. As a simple preface the gardener may note the following points : all *Primulas* of the two groups headed by *P. Auricula* and by *P. marginata* are of *quite easy culture in any light limy loam, in sun or shade, preferably on rock*. The mat-forming species represented by *P. Clusiana* are even simpler in their needs, *loving any open place in full soil* (a limy peat for choice, but the richest loam is as well accepted) *quite independent of rock, sun or shade, but with a marked love of sun*. The sections of *P. hirsuta* and *P. Allionii* enjoy, prefer, or demand a *tight crevice in firm rock, usually calcareous, in sun or shade*. For all the non-paludose species the soil required is a fairly cool, rich loam, clammy rather than

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dusty, but perfectly drained : lime is much beloved by all but a very few species, and even these seem indifferent in cultivation.

There are also a few Himalayan Primulas in our gardens, but these are only a dim foretaste of the marvellous treasures that may some day, with luck, flow in upon us from the glaciers, peaks and arêtes of Yunnan and Szechuen. Their beautiful pictures in the *Gardeners' Chronicle* perpetually torture us with envy. They sound and seem to be of almost inconceivable loveliness, and many of them will be of commensurate difficulty. Therefore our attention for the moment is concentrated on our lovely European species.

(Further and fuller information will be found in my articles in the *Gardeners' Chronicle* during 1911.)

The vast race of Primula is almost wholly temperate and Alpine in habit : the European Alps form one important focal centre, but the main radiant point of the family is on the Northern slope of the Himalaya, whence so many glorious treasures are long overdue in our gardens. Primulas are very endemic. One species will restrict itself wholly to two or three mountain valleys, while another occupies those immediately to North or South. So marked is this tendency in the *hirsuta*-section, for instance, as to make one feel that many of the named species are locally developed (but final and settled) variations from one very ancient and long vanished archetype. The race, in Europe, definitely prefers the Southerly side of the Alps : N. Italy and S. Austria are as rich in rare Primulas as Switzerland is poor.

Their propagation is best achieved by division of the clumps at almost any time during the season, but most preferably in September, when the crowns are losing

their roots of the current season, and getting ready to send out the new ones that are to anchor them firm through the winter. Their fat root-stocks may also be sliced up and put in as cuttings, when they will freely bud and root. Seed I do not find a very rapid or certain method of increase among the Alpines : germination is often slow and always capricious—although I have had seedlings of *Allionii* come up like cress. In nature they seed freely, and no less freely interbreed : there is a very large series of natural hybrids, which will be noticed under their parents ; they are singularly lovely, specially robust, and of happy culture in any open limy loam, with or without rock-work. They also thrive here in moraine. Their worst fault is that, where they descend from *minima* or *Auricula*, they inherit a fatal attraction for slugs. The flowering period of almost all our Primulas is from March to May.

Primula Allionii.—We lead off with the choicest and rarest pride of the rock-haunting Primulas. *P. Allionii* is entirely confined to a very few stations in the Maritime Alps, where, on cliffs and in grottoes of stark limestone, it forms spreading masses made up of hundreds of sticky-leaved, grey-looking rosettes which never die, but protrude new ones at the end of an ever-lengthening trunk of withered foliage. The stem-less flowers (March—May) are of enormous size and the most exquisite melting-pink, with a starry white eye. *P. Allionii* has a wholly undeserved reputation for difficulty. In point of fact, it is a surprisingly willing treasure, absolutely slug-proof with me. It *must* have a perfectly firm crevice in limestone : but after that it seems to care nothing, at any rate here, whether it be grilled with heat, or tucked into a sunless cavity—sheltered from wind and rain, or exposed to all

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the gales and deluges that come. Cuttings strike readily about September. Also, try seed, if you can be sure of getting it fresh.

P. amoena of Robinson is *P. acaulis rubra*.

Primula Auricula is the golden glory of the limestone Alps—a fat great plant of the crevices, with leathery powdered leaves and tall-stemmed heads of rich yellow flowers. There are many forms :—huge *Bauhinii*, with a line of powder round the leaves : dusky green, narrow-leaved little *monacensis*, which has survived from the glacial period on the Bavarian moorlands : *Obristii*, dark, sulphur-yellow and sweet : *ciliata*, the Dolomitic Auricula, small, with sharply toothed leaves, and brilliantly yellow blossoms : and a strange, so far unplaced, musk-scented, thick-leaved plant which I found in Austria. But, indeed, as you get South *P. Auricula* never wearies of taking local developments. All of these are perfectly easy, robust and beautiful. But with the powder of *P. Auricula*-type they also lose type-Auricula's immunity to slugs.

Perfectly robust, too, are all the hardy garden Auriculas, which are hybrids, for the last two or three centuries, through many generations of interbreeding between *P. Auricula* and *P. hirsuta*. The vast generic name of all these is *P. pubescens*, under which are also lumped the hybrids of *P. Auricula* with *P. villosa*, and with *P. viscosa*. The forms, therefore, are countless : a cluster-headed purple beauty which is called in catalogues *P. decora*, is one ; another is talked of as *P. "viscosa"* Mrs. J. H. Wilson, which is an imperial free-growing rock-jewel with purple flowers, but an obvious *pubescens*, being a cross, perhaps a secondary one, of *P. Auricula* × *P. villosa*—of which there are other forms,—*eximia*, *purpurea*, &c. *P. ciliata* of gardens (*P. ciliata* is a synonym of *P. hirsuta*), with its

beautiful lurid (*coccinea*) and violet forms must also come back to *P. pubescens*, as must *P. helvetica* (with a lovely albino), *P. nivalis* of catalogues (another dainty albino), *P. Peyritschii* (also called "*viscosa*" *major*, meaning *hirsuta major*), *P. Arctotis* and *P. rhætica*. These forms produced by nature and art are endless, and of great beauty—low-growing, tufty and small, easily divided, with rich, almost stemless heads of white, rosy, or violet flowers (only true *Auricula* gives yellow). They grow easily and sturdily; almost all of them seed and germinate readily. But the results are uncertain. And all these treasures are at the mercy of slugs.

The only other Primula of the Auricula group is the huge ramifying golden-headed *P. Palinuri* from the Neapolitan coast. It is hardy and free in any warm place, but takes a long time to develop flowering size.

P. auriculata is to my eye like a big, but much inferior *P. longiflora*. It is an Asiatic, for the cool treatment of the *farinosa*-section. Seed.

P. Beesiana is also a new Asiatic, like a magenta-purple *P. japonica*. I dislike it. Seed.

P. Bulleyana.—Splendid Chinese novelty. Strong as a cabbage in damp rich soil, with tall spikes like a golden-orange *P. japonica*. Seeds and germinates freely.

P. calycina is simply *P. glaucescens*, and so is *P. intermedia* of some catalogues.

P. capitata is an invaluable Himalayan, with round heads on tall white stems, in *autumn*, of pure violet-purple flowers. This must have a cool, but open and perfectly drained place, in not too heavy soil, if it is to be kept long as a perennial. It is, however, of the easiest culture, and seeds profusely.

P. carniolica is a S.-Eastern Austrian species, often

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catalogued, but far too rarely seen true. It is a glorious plant, like a glossy-leaved great *P. Auricula*, with heads (on stout stems) of large, white-eyed flowers of a clear rose.

P. cashmeriana, a huge cabbage-like plant, with round fat heads in spring of crowded lilac flowers. It grows in any rich, open soil, and is a vast and pallid *P. capitata*. The undersides of its leaves are powdered with gold, which favourably differentiates it from the even coarser *P. denticulata*. Upper India, Seed. There is a lovely albino of both these species; but none, it so far seems, of *P. capitata*.

P. Clusiana is the first member I come to of a noble section. All form masses of congregated crowns, all have glossy, leathery, entire leaves, all have heads on 4-inch stems of immense round, rosy flowers with a white eye, all are independent of rock (though splendid in a crevice), and love the highest grassy ridges in full sun (usually, but not necessarily) on the Italian and S. Austrian Alps. And all are of the very heartiest culture here, in any open place, whether cool or warm, in rock-work or full soil. And all are nearly, if not wholly, slug-proof. Fringy-flowered, resplendent *P. Clusiana* has the limestone Alps of Austria for its appanage; robust *P. glaucescens* those of Como, where it riots among the cool, dank brushwood (but no less in the hottest moraines of Kent); smaller *P. Wulfeniana* occupies the Venetian and Carnic ranges; while the intervening space is monopolised by the amplest and most royally glorious of all, *P. spectabilis* with its leathery pock-marked leaves.

Three of these share their hills with *P. minima*, and accordingly produce exquisite hybrids, quite small in growth, with enormous flowers. They are as robust as their parents in full open soil, but they most of them inherit

minima's fatal fascination for slugs. The child of *spectabilis* is called *P. Facchinii* or *P. Dumoulinii*, according as it produces two flowers or one to a stem: *Clusiana* × *minima* is *P. intermedia*, a priceless lovely prize: *minima* × *Wulfeniana* is the least brilliant, I think; it is called *P. vochinensis* if it has a stem to its flowers, and *P. serratifolia* if it has none. Division for all these.

P. Cockburniana is a new Asiatic, with delicate whorled sprays of scarlet orange flowers. It grows freely, germinates copiously, and is quite perennial, like *P. capitata*, if carefully watched in a well-drained cool place, and frequently divided. It is a parent of marvellous *P. Unique*, which in its many forms is a fiery scarlet *P. japonica*: as easy, vigorous and robust in any damp rich soil.

P. cortusoeides is a lovely ramping Japanese woodland species, with fern-like leaves and tall heads of rosy great flowers, often lacerated and fringed. There are innumerable forms, and they are precious for the cool rich border (syn. *P. Sieboldii*). Akin to this is *P. Veitchi*, with flowers of a truculent magenta. Division, or seed. *P. patens* is a form of *P. cortusoeides*.

P. darialica.—A very rare species, akin to *farinosa* in every way, though sturdier and dwarfer.

P. deorum.—A Servian plant rather like an enormous *P. glutinosa*, but to my eye far less attractive, alike in habit of growth and flower. It is the only other member of *glutinosa*'s section, and is quite as difficult. It lives and thrives high up by the melting snow.

P. farinosa.—This, our beloved native beauty, and the most universal of all Primulas, ranging in many forms from Pole to Pole across Continent to Continent of the Northern hemisphere, is justly considered one of the most trying and uncertain in the garden. It is a weed here, wild by the

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waysides, on rocks, among mosses, or in the coarsest grass. But for Southern gardens I would suggest that there it dislikes a too torrid sun, that it should have a very rich, heavy, clayey loam, be kept dryish (though not parched) through spring and early summer, and be deluged with water all through the autumn months, when it is going to rest. I would also urge that it should never be planted in arid isolation, but wadded up with annual grasses and plants, or such delicate perennials as *Festuca ovina tenuifolia* and *Wahlenbergia hederacea*. Seed. There is a glorious *true* albino : and a unique blue form that I collected on these hills. *P. scotica* is dwarfer, stockier, and even more capricious, with bigger flowers of deeper colour.

The same remarks apply to *P. longiflora* of the high grassy Alps of S. Austria. It is a *farinosa* writ large, with colossal flowers and a long purple throat. The blossoms are of a deeper mauve-rose than the soft pink of *P. farinosa*. This plant is absurdly rare in cultivation : it easily waxes fat and splendid in any cool shady corner in damp rich soil. I have it naturalised with *P. farinosa*. Seed : the two species, so often found together, have yielded no hybrids (any more than *Gentiana acaulis* with *G. verna*).

P. Forrestii is a rare, new, splendid and easy-tempered plant, like a big golden clumped Polyanthus, very sweet, from hot limestone cliffs in China, where it lives for ever (see supplementary illustration in *Gardeners' Chronicle*, April 13, 1912).

P. "frondosa" of catalogues is very valuable, but not the genuine species of Janka, if there is such a thing. Our *P. "frondosa"* is a very stalwart bushy and unspecified form of *farinosa*, twice the size of the type, a trifle mean in flower, but very free. It is of robust growth anywhere, and seeds itself copiously.

P. glutinosa.—A lovely jewel, but difficult. On very high, wet, peaty places in the S.-Eastern Alps, *never on limestone*, it forms tufts of narrow sticky leaves, with 3-inch stems and heads of imperial blue-violet flowers, richly fragrant. *Must* have a damp, cool, peaty and non-calcareous corner : not hard to keep, but a very shy flowerer—even in nature, though there its multitudes are so incalculable as to film the distances with blue. Division.

It frequently grows with *P. minima*, and an extensive series of hybrids results, which are, for the most part, much easier than *P. glutinosa*, in any cool, open marshy turf, composed of mild, non-aggressive neighbours. *P. Huteri* and *P. salisburgensis* are nearest to *glutinosa*, liking a good deal of moisture ; *P. biflora* is a noble and magnified *minima* ; and *P. Flærkeana*, the finest of the lot, and a free thriver, has two or three of *minima*'s wide-spread flowers, of a fulminating rose-violet, at the top of 3-inch stems. *Glutinosa*'s stickiness confers on all the hybrids a certain immunity to slugs.

P. hirsuta.—This is the little plant which catalogues and authorities, who should know better, obstinately persist in calling *P. viscosa* (or *P. ciliata*). It makes neat rosettes of toothed leaves, clothed in golden or tawny fur (usually not russet as in the rest of its section) with almost stemless heads, wide and large, of handsome pink flowers with a white eye. From granitic Alps, but indifferent in culture. The section is known by always having this vesture of dusky or russet fur (the next, that of *P. Allionii*, has a colourless pelt) : they have flower stems rising little, if at all, above the leaves, and they are easy, slug-proof thrivers in the rock-garden, but are saxatile in their wishes, and should be squeezed into firm rock-work *to do their best*. The one exception is glorious **P. pedemontana**, which flows down

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happily on to the highest moors of the Graian Alps and turns them pink; it is distinct also in having taller stems, with rich heads of blossom, white-eyed and rosy. It has a marked hem of rust-coloured fur to its dark leaves. Not unlike it in habit is the pale, sun-loving, and very rare *P. apennina*. *P. cottia* is even rarer still, from the high and torrid granites round Mte. Viso. It stands sun as heartily as *P. apennina*. *P. villosa* is a wide-spread, very dark haired and important rock species of the Eastern ranges, of which *P. norica*, *P. Jacquinii* and *P. commutata* are forms. The last of this cliff-loving section is *P. oenensis*, which catalogues try to call *P. daonensis* and *P. cadinensis*. It has a taller stem than is usual, stalked leaves, invariably toothed, and flowers of a paler rose than type-*hirsuta*—of which, however, there are, of course, varying forms, and an albino.

In hybrids this section is very fertile. We have already noticed the “*pubescens*” hybrid with *P. Auricula*: but *P. hirsuta* also gives a singularly lovely offspring, called *P. Heeri*, by a succeeding species, *P. integrifolia*. *P. Heeri* is remarkably brilliant, with enormous bright pink flowers on 4-inch stems. But indeed, *P. hirsuta*, not specially striking in itself, produces children of peculiar loveliness. Its crosses with *P. minima* have resulted in a race of minutely dwarf colossal-flowered plants of most resplendent splendour. These are *P. Steinii*, *P. Kellereri* and *P. Forsteri* of the Brenner Alps—of which *Forsteri* is closer to *minima*, and *Kellereri* to *hirsuta*. With *P. viscosa* *P. hirsuta* produces magnificent *P. Berninæ*, not uncommon in the Engadine, taller than *hirsuta*, with heads of larger, rarer flowers, narrower, purple, and lilac-throated. With *minima* *P. oenensis* gives the rare *P. coronata*, in two named forms, *pumila* and *Widmeræ*: and *P. villosa* × *P. minima* results in *P. Sturii* and *P. truncata*. *Apennina* and *cottia*

have had no recorded children : *P. pedemontana* has just yielded me, on the Mt. Cenis, by *P. viscosa*, the new *P. Bowlesii*, which of course is very close in style and beauty to *P. Berninæ* (*P. Salisii*). For all these, good open soil ; division of clumps, preferably in August or September.

P. Hölscheri in needs and aspect is like a rose-pink *P. luteola*, *q.v.*

P. integrifolia hails from high granitic moors of the Engadine, where it makes lawns of glossy-green, pointed-leaved rosettes. It has two or three very large pale rose-purple flowers on 3-inch stems. It closely resembles, at first sight, the Primulas of the Clusiana group. Easy culture. Division. Besides *P. Heeri*, it has yielded two fine hybrids, *P. Dinyana* and *P. Murettiana*, either way round with great *P. viscosa*. These are each about 4-5 inches, with big flowers of brilliant purple. They are sometimes seen in very wet places in moss, and seem, at home, to like being squeezed tightly in a rock, to make them flower. Division. (*P. Murettiana* of catalogues seems false.)

P. involucrata (*Munroi*).—An exquisite Himalayan for the wettest bog, with large, pure white (or bluey-white) flowers on 8-inch stems, two or three to a stem. Division in early summer. It grows very easily, sows itself, and spreads freely. *P. sibirica* is practically the same, but of a faint pinkish lilac.

P. japonica is a noble three-foot bog-plant. Be sure and get a form of good colour. Division and profuse seed, which I advise sowing out in the open.

P. Kitaibeliana is a Servian cousin of *P. integrifolia*, almost unknown to culture, with odorous glandular leaves.

P. Littoniana is an Asiatic, with tall rat-tails of red bracts and tiny purple flowers. Not pretty so much as curious. Open ground.

P. luteola is a very little known, but easy cool-border species, with finely toothed, glossyish oval leaves and heads of lovely sulphur flowers on 8-inch stems *in summer*. Seed or division.

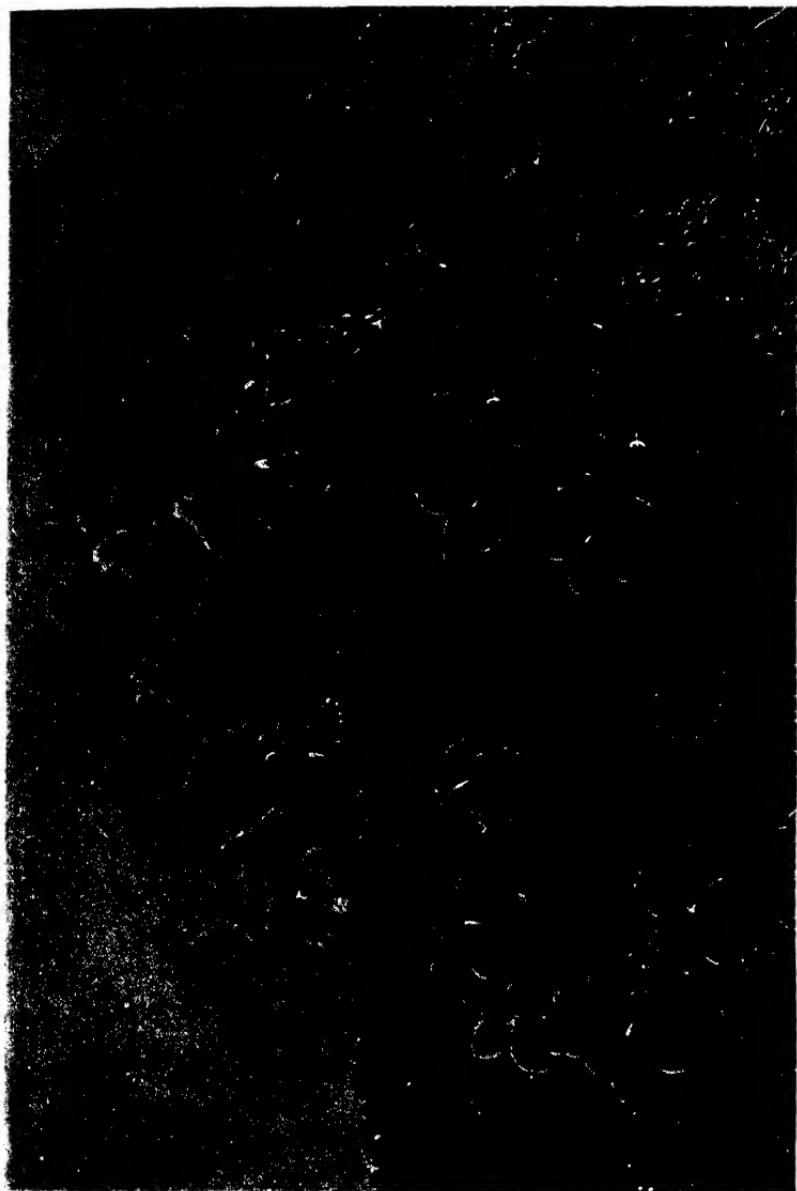
P. marginata.—A precious beauty from the Maritime and Graian Alps, forming long woody pendent trunks, with rosettes of toothed silver-grey leaves, outlined with golden powder. Flowers very large, in heads of 4-8, of the most entrancing Lilac-lavender. Thrives readily everywhere, but is at its best hanging out of a crevice; for so strong is its passion for doing this, that it can never forget it isn't being allowed to, but tries to hang down from a flat open border, with the result that it works out of the ground leggily and looks ugly. It can always, however, be pulled to pieces and replanted. Offsets tugged from the parent root easily at any time.

P. marginata has yielded in gardens one magnificent hybrid already, by a primary hybrid called *venusta*, which has *Auricula* and *carniolica* for its parents, and is, roughly, like a rose-coloured *P. Auricula*. *P. marginata* × *venusta* is *P. Marven*, like an *Auricula* in general habit, with the powdered hem of *marginata*, and stalwart heads of rich blue-violet flowers on 6-inch stems. It is perfectly vigorous and easy, but almost un procurable.

P. Maximowiczii is a stalwart Asiatic novelty, very rare, and unproved in culture. It is like a bright scarlet Hyacinth, and its lush appearance suggests a cool rich corner.

P. minima is a minute jewel, not an inch high, forming vast dense carpets over all the hills on which it lives (Brenner district, Dolomites, and Eastward *only*). The stemless flowers are as large as a shilling, countless as the stars, brilliantly rosy. This treasure is quite easy to grow in slopes or pockets of open peaty loam (not in rocks) if it

PLATE VIII
CAMPANULA PORTENSCHLAGIANA



is well wadded up with other ramifiers like *Gentiana verna* and *Festuca ovina tenuifolia*, so as not to be in a parched isolation, but making one thread in a carpet richer than any designed by art. In nature it bears torrid heat, and grows indifferently on lime or granite. In the South of England, however, it might be best to keep it on cool exposures. Division. (It spreads freely.)

P. muscarioeides (seed) is like a tiny *P. Littoniana*, not beautiful, but alluring, like a little grape Hyacinth. Open soil.

P. "nivalis" of catalogues is only an albino form of *P. pubescens*, q.v. Beautiful and easy. There are two albinos, really, in this range of hybrids (if not more); the second, which catalogues call *P. helvetica alba*, is, I think, the better and finer-flowered of the two.

P. nivalis (*Pallas*) is a tall difficult splendour from Turkestan, not in cultivation.

P. Parryi—An easy American bog-plant. Heads of big rosy blossom on 6-inch stems. Division.

P. Poissonii is a tall and, to my eye, coarse Chinese bog-plant, with flabby leaves and magenta-lilac flowers in tiers. It is not invariably hardy.

P. pulverulenta is a darker flowered *P. japonica*, with powdered stems.

P. purpurea (*Stuartii*) is almost impossibly miffy and difficult, like a big refined and very farinose *farinosa*, with loose, elegant heads of violet-coloured flowers.

P. Reidii is a dainty and extremely rare Himâlyan high Alpine, almost unknown.

P. Reinii.—A most exquisite, uncertain, or unproved Japanese, like a microscopic *P. cortusoeides*, with huge flowers.

P. rosea is a gorgeous bog-plant, typical of the marvellous Primulas of the high Himâlyan glaciers, of which,

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however, it is the only species as yet in cultivation. Forms dense masses, even in running water, and flowers abundantly before the leaves, in March-April, on unguessed stems, which elongate after flowering till they are 8 inches or more by seeding time. Flowers of a dazzling pure carmine-rose. Division or seed.

P. Rusbyi.—A hardy Mexican for the rock-garden. Flowers livid purple in summer.

P. sikkimensis is a most glorious Himâyan species for bog, or cool rich border. Like a colossal Cowslip, with 2½-foot stems, and then pendent loose showers of far more wonderful flowers, immense, cup-shaped, of a very pure and bland Milan-Soufflé yellow. Seed and division. Quite easy.

P. suffrutescens.—A Californian rock plant for a warm chink. Tall 9-inch stems crowned by heads of magenta-rosy flowers. Habit of the plant sub-shrubby-looking, neat and dwarf. Fairly easy culture. Division.

P. tyrolensis.—Now we go back to real rock plants. This is a tiny species confined to the hardest limestone crevices of the Dolomites, where it forms wide masses. The leaves never die, but the new rosettes come out from the top of a lengthening cone of dead ones exactly as in *P. Allionii*, though the whole plant is much smaller, rounder-leaved and denser. The stemless flowers are huge, of a gentle white-eyed pink. The plant *must* have a choice, well drained and perfectly firm chink in rocks. Careful division about August.

P. tyrolensis gives two hybrids. One of them with *P. minima*: this is the rare and exquisite *P. Juribella*, a very dear little treasure, which grows with *minima*, and is to be treated as such. Its flowers are large, delicately rosy. Division. The other, with *P. Wulfeniana*, is quite

common in cultivation and catalogues, where it appears either as *P. cridalensis* or as *P. Venzoi* (I believe it also to be *P. Murettiana* of catalogues). It is intermediate between its parents, very pretty, but not of specially startling loveliness. An easy thriver. Division. *Tyroleensis* seems to bequeath to its children its immunity to slugs.

P. viscosa is the noble plant which catalogues still try to sell you under the names of *P. graveolens* and *P. latifolia*. More than that, they iniquitously try to fob off upon you its named varieties as separate species. *P. viscosa*, type, is a big, robust plant, forming stout trunks and masses, in the Engadine, the Graian, Cottian, and Maritime Alps. Its leaves are long, oval-pointed, rather floppy, greyish looking, with glands that secrete a goaty smell. The stalwart, tall flower-stems, about a foot high at their best, carry abundance of nodding, rather narrow flowers of rich violet purple, in a one-sided head. The species is a passionate lime-hater in nature, but in the garden seems indifferent, like *villosa*, *hirsuta* and *cottia*. It is a quite easy doer in any fair treatment, liking a warm place. Its named local forms are (1) *pyrenaica*, from the Pyrenees, very large and rich and ample, (2) *cynoglossifolia* (too often offered you as a species), the form of the Graian, Cottian and Maritime Alps, usually affecting crevices of cliffs, (3) *graveolens*, the Engadine development, which is much more willing to make huge masses in open ground on the hillside. Division, and cuttings from the root-stock.

P. vittata.—An attractive Asiatic. Tall stems, and heads of pendulous, rosy-magenta flowers. Cool open soil. Seed. Akin to this is *P. deflexa*.

P. Winteri.—A sensational introduction from Asia—a form of *P. petiolaris*. It is as yet quite unproved and

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untried, but looks robust, even if not long-lived. Forms huge rosettes like a densely powdered Auricula, with very large flowers, of a lovely lilac lavender (in the best forms), sitting singly among them. It seems as if cool, rich, open-ground culture would suit it : and it is evident that it can be raised from seed.

CHAPTER XI OTHER TREASURES

THE Gentians are but little cattle, as all gardeners know to their cost. Even for the easiest, a very rich vegetable soil with frequent top-dressings of lime-rubble, abundant drainage and water, are advisable. In point of fact, the family (I am only dealing here, of course, with the smaller, mountain-loving species) is far more dependent than any other Alpine race on Alpine soil and atmospheric conditions.

Gentiana acaulis is a species made artificially up out of five local forms, *G. Kochiana*, *G. alpina* and *G. excisa*, slate-coloured or indigo, from the granite : *G. angustifolia* and *G. Clusii*, sapphire-blue, from the limestone. All these are mimps. Our garden plant (so ridiculously called Gentianella) is a quite distinct thing, compact, spreading, free and vigorous, of unknown history and origin, but very old in cultivation. In favourable places it makes wide borders, as often in old cottage gardens in the North. It should, to give its richest show, be pulled to pieces and replanted every five years. Stones may be buried among its roots in the South to hold moisture. It likes richness, sun, and damp. There is a rather ugly white form, and a resplendent pale blue one (*G. dinarica* and *G. altaica* are others yet unproven). Similar conditions are your best hope with

the far more difficult, but gloriously incalculable little *G. verna*; much more leaf mould may be given to this, much more sand, much more stone, much more moisture, and much more care. This has the same colour forms as *acaulis*: its high Alpine development, *G. brachyphylla*, is exquisite, but almost, if not quite, impossible.

So, really, is *G. bavarica*, the dark blue little bog-Gentian. This may linger on in wet moraine, or pure wet sand; and may even, in Scotch gardens (with a 40-inch annual rainfall), make a wide patch in a border of peaty humus without any further notice. But in ordinary culture it is impossible: so is its Alpine form, *G. imbricata*. *G. pyrenaica* (open peaty heaths) has flowers of a wonderful lilac-purple: *G. pumila* (high marshy Alps) is more like a frail, dark sapphire-violet *verna*. The easiest of the whole group, after the Gentianella, is that rare and obscure species called *G. angulosa*, or *G. aestiva*, which is simply *G. verna*, but twice as big, twice as brilliant, twice as easy, and twice as robust. It grows in any fair conditions, and flowers incessantly (Schlern, Mont Cenis, &c.).

Of the larger Gentians (*all late summer bloomers*) *G. asclepiadea*, with long showers of sapphire trumpets, is glorious for bog or cool border, and *G. septemfida*, much smaller, with cluster heads of great azure trumpets on 6-inch stems, is a glory for a cool spot: and the noblest and rarest of new introductions is fortunately among the easiest of the race; this is *G. Kurroo*, with a basal tuft of narrow dark leaves, and stems that creep along the ground in August, and then arch up, carrying at rare intervals, three or four splendid flowers of a clear azure.

Since we are dealing with difficulties, let us bravely go on up to the high Alpine Androsaces. They form tight downy domes of pink or white, in the stark cliffs of the

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topmost peaks. They all *insist* on being squeezed into firm rock, detest the least drop of damp in winter, want a moist air round them in summer, and are, in short, as exacting as they are beautiful. The two easiest are *A. pubescens* and *A. helvetica*: then follow *A. pyrenaica*, *A. cylindrica*, *A. hirtella*, *A. imbricata*. *A. Matildæ*, from the Gran Sasso d'Italia, is glossy, and therefore much easier. *A. alpina* (*A. glacialis*, as we used to call it) is a glory of rosy mats in the high damp Alpine shingles: not a rock plant, but difficult; sadly shy and poor in flower, even if you get it to thrive in some very rich, cool, gritty mould, in a sunny place. Similar treatment will also suit *A. ciliata*, *A. Wulfeniana*, *A. Haussmannii*, and *A. Charpentieri*: the others, with me, are *only* for firm rock. The Himalayan Androsaces, on the other hand, are easy ramping beauties for any sunny sandy slopes or moraine:—*foliosa*, *sarmentosa*, *lanuginosa* are great spreaders, with pink Verbena heads of blossom (all summer through from *lanuginosa*); *semperfivoeides*, *primuloeides* and *sarmentosa Chumbyi* are neater, but no less easy. The utmost that any woolly sort requires is a pane of glass in a wet winter. The same applies to the easy European species *A. villosa*, *A. obtusifolia*, *A. Chamaejasme*, much smaller and choicer, with more or less silky rosettes spreading about, and clusters of pearly flowers on 3-inch stems (*A. lactea* is taller, for cool corners; and *A. arachnoidea* of catalogues is only one among the hundred and ninety-nine forms of universal *A. villosa*). No precautions, however, are asked by dainty *A. carnea*, with its varieties *Laggeri* and *eximia*, which, like all these last, are Alpine turf plants, and being like fine moss, quite glossy (with brilliant rosy flowers), run no sort of peril from damp, and luxuriate in any choice cool soil in a sunny spot. They must not, of course, be parched: nor must their golden twin, the only

yellow Androsace, which has changed its name as often as the Empress Zoe, having been in its day *Androsace*, *Gregorya*, *Primula*, *Aretia*, in turns, till now it has settled down for the time as *Douglasia Vitaliana*—a precious easy thing—forming a prostrate mass of green fur in any good sunny slope, quite hidden with a glory of little citron-yellow Jasmine blossoms.

Who means to grow the Soldanellas? In any damp open soil they will freely thrive and spread without attention; but not always will they flower as they should. They want to think they are being kept dry by snow in winter. Therefore put a pane of glass over them to keep out rain; and they will often be taken in—while in favoured districts of the North they do not require the cheat. The best are *S. montana*, *hungarica* (*pyrolæfolia*), and smaller *alpina* (minute *pusilla* and *minima* are difficult snow plants). And anyone may envy you when they hang out their dancing fringy bells of violet.

Eritrichium.—And so they will, a thousand times more, if ever you can show a flowering three-year-old tuffet of *Eritrichium nanum*, its pin-cushion of gleaming silver-fluffy leaves quite hidden by its azure forget-me-nots. To grow the King of the Alps is the summit—the Matterhorn—of a gardener's ambition: the plant is seen only, and rarely, at very great elevations, on the granitic ranges, in cliffs or in the highest arêtes (growing less rare in the S.-Eastern chains). Its nature and need are precisely those of the cushion Androsaces: it must be perfectly dry from September to April, and yet never be parched in summer. It will grow in the moraine, but appreciates a cool, gritty, vegetable mixture peat in full sun, tightly wadded into a firm place: in which case it does not mind if the rock be calcareous.

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When all is said and done Compositæ principally means Edelweiss to the rock-gardener, although the Flannel-flower is not the rarest, but the commonest of plants throughout the world's ranges, and is a desert species, not an Alpine. It has no glamour of any sort ; and grows by the acre over every high level and slope of the upmost Alps wherever the ground is stony. Seed. This uninteresting but pretty weed is of the readiest temper anywhere in the sun, in any soil sufficiently worthless. Rich ground and winter wet are its only danger ; and lime helps to make its fraudulent flower keep white.

Of the Speedwells the most useful is *Veronica rupestris* (*V. Teucrium dubia*), the *Mazarine*—yard-long sheets of green with myriad little azure spikes : for anywhere. *V. repens* is closer and neater, with pale blue stars flat on the mass : *V. saxatilis* is lovely : *V. canescens* is the smallest of all, nearly invisible, with lovely little celestial cups in full and late summer, peppered over what looks like bare earth. This is a refined New Zealander for a warm sandy place or moraine. I have no space for more Speedwells.

Then, nearly first of everything in universal merit, for any garden, rich or poor, come the Mossy Phloxes. These are of easiest culture and quickest spread in any good loam in open sunny gardens : forming huge mossy carpets, covered in June with profuse big stars of white, pink, rose, or lavender-blue. Among the best are *Nelsonii* (white), *nivalis* (white), *G. F. Wilson*, or *lilacina* (blue), *Stellaria* (grey), *rosea major*, *Seraph*, *Leila*, *annulata*, *Vivid* (hot pink), &c. There are also, in this kind, *P. procumbens* and *P. verna*, both trailers, with heads of vivid rosy bloom. These all grow well from cuttings. And of the many Wood-Sorrels, I will only mention the Falkland Island treasure *Oxalis enneaphylla*, which thrives freely with its ninefold

grey leaves in a good corner (cool and rich and shady for choice), with profusion, throughout the summer, of pearl-white little Convolvuli nestling among them.

No considerations of space, though (and in these pages lately the massacre of essential plants has been quite Herodian in its horror), shall stop me now from a word of final notice to my readers as to their possibilities among shrubs, such as the Alpine Willows that ramp and creep quite flat,—*Salix herbacea*, *retusa*, *reticulata*, and *serpyllifolia*; the Alpen-Rosen, or Alpine Rhododendrons, for peat: *Daphne alpina*, *D. Cneorum*, *D. striata*, *D. Blagayana*, *D. Fioniana*—all charming sweet little trailing shrubs (*alpina* and *Fioniana* are bushes) for rich, sandy, stony peat on limestone or sandstone, with plenty of stone piled on them and about: and especially that rarest glorious pearl of their race, the tiny prostrate *Daphne rupestris*, with its enormous sweet trumpets of rosy pink. This prize of the Lombard precipices, though, must be in very firm hot rock, or squeezed in a chink, it must have full sun, it must have abundant lime in its soil or stone. And the soil should be a rich vegetable mould, perfectly drained. The same conditions apply to that larger but no less precious little shrub, pink-saucered *Rhodothamnus* (or *Rhododendron*) *Chamæcistus* from the Dolomitic slopes and ridges.

So now for my last counsel. Though I do not recommend ordinary Daffodils for small rockeries, as they die away so untidily, I do most strongly urge the planting up of the whole rock-work, among the plants, and in the trailers, with innumerable little bulbs, which take no trouble, glorify dull moments before and after heyday, and in the heyday are safe out of sight underground. Early Crocuses (*vernus*, *Imperati*, *etruscus*, *chrysanthus*, *biflorus*, *Sieberi*,

versicolor), Squills, Snowdrop, Chionodoxas, *Narcissus minor*, *N. triandrus*, *N. Bulbocodium*, *N. cyclamineus*, *N. minimus* for spring: for autumn, above all else, hundreds on thousands of those cheap, indestructible autumn Crocuses (the real true Crocus) so glorious and so apparently unknown, despite their loveliness and cheapness and vigour. Even among the very neatest, choicest things (such as *Primula minima* and *Gentiana verna*) take pains to poke profusion of '*Crocus speciosus*, *C. sp. Aitchisonii*: *C. zonatus*, *C. iridiflorus*, *C. cilicicus*, *C. medius*, *C. sativus*, and *C. pulchellus*, in the most wonderful shades of lavender and blue and purple, to perk from amid your now flowerless mats of *Erodium* or *Dryas*, and carry the glory of your garden far on into the deadness of the year, when only they and the roseate or snowy sweet butterflies of *Cyclamen europaeum* and *hederaefolium*, hovering above their marbled leaves in moraine or barest gravel-path, remain to keep you in memory of all good things that are past, in hope of all good things to come again.

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a prefixed to any species or race means that it is of perfectly robust nature and easy culture in any fair place.

β prefixed to any species or race means that it is of easy culture in proper circumstances and with reasonable care.

γ prefixed to any species or race means that it is of difficult culture or tricky constitution.

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